Charduar Rubber Plantation.

Tenders are invited for the purchase of the Charduar Government Rubber plantation (including buildings) situated in the Darrang District, Eastern Bengal and Assam. The plantation, which would be leased on periodic lease, covers about 3,000 acres of which 1,700 acres are fully and 1,047 acres partially stocked with Ficus Elastica trees (between 25,000 and 30,000 in number.)

A contiguous area of 2,000 acres would if desirable be leased on favourable terms for extensions. A memorandum giving full particulars of the estate and conditions of tender and sale can be obtained from the Conservator of Forests, Western Circle, Eastern Bengal and Assam, or from Messrs. GRINDLAY & CO., 51 Parliament Street, London, S. W. Tenders, which will be treated as confidential, should be accompanied by a deposit of Rs. 1,000 and should reach the undersigned not later than the 1st December, 1910. The Local Government does not bind itself to accept the highest or any tender.

A. V. MONRO,
Conservator of Forests, W. Circle,
Eastern Bengal and Assam.

SHILLONG,
23rd July, 1910.

the championship cup already referred to. The second prize—a cup offered by Messrs John Little & Co.—was secured by Bukit Rajah estates.

Much interest was taken in a small case labelled historical rubber shown by the Botanical Gardens. It contained the earliest samples of Para rubber made from cultivated trees, the first biscuit, the first block, the first cultivated rubber sold in the London Market, the first tyres made from cultivated rubber in Singapore, and samples of amazons rubber brought from Brazil by James Collins who was the first to bring living plants of Hevea Braziliensis to England. The Department also showed some very superior smoked sheet and biscuit, the spindles already alluded to, and some balls of Jelutong prepared with Purub.

Rubber machinery, tools, and all kinds of things suitable for a planter on an estate formed a large feature of the trade exhibits.

Messrs. Guthrie showed some fine rubber machinery for sheet making in action, Latex being supplied from the Singapore United estates, and up to date machinery was shown by the Federated Engineering Company, Riley Hargreaves and Howarth Erskine.

In Paterson Simons' exhibition was the Da Costa machine which was in work every day, and attracted a crowd of visitors. The machine was only a small one, but of course for estate purposes is made on a more extensive scale. Its system is to force smoke through the latex by steam pressure and thus coagulate it. The coagulum is then conveyed to other machinery and converted into block or crepe as may be required. The idea is good and the coagulation is quick, but it does not appear that sufficient smoke goes into the latex, so that when dry it is difficult to detect the scent of smoke. At the same time the temperature of the latex is rather higher than one would like it to be. Samples of block and crepe were made by the process shown in the exhibition.

Disc-ploughs, planter's bungalows, tools, etc., were exhibited on various parts of the ground, and the Singapore Rubber Works exhibited a series of articles manufactured from rubber, such as tyres, valves, plugs, etc.

DIVISION B.—FLOWERS, FRUITS & VEGETABLES.

This was the largest Show that has been held in Singapore for many years, and a very great improvement on that held under similar auspices in 1909. The entries were a record, totalling as they did upwards of 982. They were as follows:—

Singapore	...	...	234
Penang	...	...	423
Malacca	...	...	90
Perak	...	...	114
Selangor	...	...	60
Negri Sembilan	...	...	56
Muar	...	...	5

although somewhat a large number of these being from the F. M. S. and Penang did not reach here in show condition, and therefore were not staged.

The exhibits were placed in a large rectangular shed in front of which were erected wide double gables. This plan afforded ample space, including an enclosed dais from which the Governor made his speech, and from which the cups were presented. In this part of the shed were placed garden seats and they were much patronised during the whole of the show.

As regards plants, the Botanic Gardens staged three beautiful, groups including many choice specimens, largely composed of Aroids, Mr. J. d'A. Pereira also exhibited, not for competition, a tasteful group of foliage plants. These added much to the decoration of the gable entrance.

In Flowering plants the Show was perhaps somewhat disappointing. There was nothing in this section of any special merit, and yet at the time of the Show there were existing in gardens, mostly owned by Chinese, magnificent specimens of Chrysanthemums, Cockscombs, Gaillardias, Ageratums, Petunias, Balsams, Dahlias, Asters, and others, which would have made a very brilliant display, but although urged to exhibit by several members of the Committee, they, in most instances, declined to do so. Here was much felt the loss of Mr. Choa Kim Kiat, who was such a prominent exhibitor in former times.

As regards Foliage Plants, there were good collections. Of special mention were Dieffenbachias, Crotons and Palms, but we missed the grand specimens of Dracaenas, Marantas, and Calatheas, which were such a prominent feature of Shows in past years. Selaginellas have also dropped out, only small plants being shewn, but Ferns, and especially Adiantums were well shewn by one exhibitor, and a magnificent specimen of Gymnogramme (Golden Fern) was shewn by Mrs. Stewart. Palms also were a good class, and here there were many entries. Caladiums were well represented; Mr. Joo Tan Chin being far ahead of all other competitors. He also shewed some of the best foliage plants. In Begonias there was good competition, both in the Rex and flowering kinds. This being an unfortunate time of year, Orchids were very scarce; there was no exhibit of any special merit, but one uncommon plant, an Acampe, was shewn in good condition. The specimen prize went to a large plant of *Grammatophyllum Measuresianum*. with three sprays.

In table decorations there were no less than 15 entries. The judges awarded four cups, taking this fact into consideration. The first prize went to Mrs. Salzmann for a well thought out arrangement of Sunflowers with Acalypha foliage and fine grasses; the second prize was awarded to Miss Lloyd, for Arundina Speciosa, fine Adiantum and grasses. The third prize was given to Mrs. Saunders and Miss Gunn for a very pretty arrangement of Antigonum and Rex Begonia foliage, whilst the fourth prize was secured by Miss Mary Lloyd, for an artistic arrangement of white Chinese Clematis.

There were very few entries for Bouquets, or Buttonholes and Sprays, Miss Norris securing the first prize for a bouquet which it would have been difficult to excel; Miss Mary Lloyd being second with a beautiful arrangement, but considered too large. The class for Cut Flowers arranged for effect was not well supported, Mrs. Felkin carrying off the first prize; and there were only two competitors for the section of Cut Flowers, Mrs. Stuart being first and Mrs. Gilmore Ellis second; the latter was a very elaborate arrangement and completely covered a table 7 ft. by 3½ ft. In wild flowers arranged for effect, Miss Clare Lloyd secured the first award.

This not being the fruit season in Singapore, almost all the exhibits travelled from Penang, Perak, Selangor and Malacca, and therefore on arrival were mostly not in the pink of condition. There were very large entries for Bananas, Pines and Limes; Durians were very scarce, being out of season. Rambutans, also, were not well represented for the same reason. Of Mangosteens there were only a few from Penang.

In Vegetables mention must first of all be made of the handsome exhibit from the Perak Government Gardens in the Larut Hills, which was beautifully staged by Mr. Long. From Singapore there were not many exhibits, Mr. Broadrick's being the most prominent. Mrs. Gad also shewed a good collection of European vegetables. Jerusalem Artichokes included some good exhibits, Mr. Broadrick here getting first prize.

In Preserved Fruits Mr. Sin Whatt Hin obtained a Silver Medal for an excellent exhibit of preserved Pineapples. Although there were many samples of Pickles and Jellies, many of them were ill-prepared and fermenting. Mrs. Moorhouse, who has had considerable experience, obtained the first prize for Pickles, Mrs. Gad gaining the second, while Mrs. Angus took the first prize for Jellies. The Chutneys were not well prepared, and the Judges refused to award any prizes.

In the same shed were shown bees at work and honeycomb from them by Father Gex, who also showed grapes and figs which are rarities here, the figs were especially excellent. Mr. Eaton showed here too Camphor grown and manufactured in Selangor, with photographs of the trees, solid camphor, camphor oil and a still which showed the method of manufacture on a small scale. He also exhibited oils from the oil palm (*Elaeis Guineensis*).

The Poultry and live stock generally with the dairy produce, were shown at the end of the ground nearest to the Esplanade, and a fine lot of chickens were shown. The Singapore Poultry Farm had some fine birds and pigeons, and also some good rabbits. Mrs. Klimmet's Victoria crowned pigeons were very much admired as was a very talkative mynah shown among the cage birds.

12/272

There was a fair competition in diary produce, but it must be admitted that it is difficult to get milk and butter down fresh from long distances, such as Penang and Perak, and the judging in this class was rather late. Cattle were not numerous and there were no pigs shown, a few fine animals, however, were on view. One Indian bull, a champion for several shows, held his own easily.

SUMMARY.

On the whole the show was a very good one, and attracted a large number of visitors, but in some points, notably Native industries, there was a great falling off from the last exhibition held here, nor was the Agricultural produce section quite as large or good, in many classes. The rubber and the horticultural sections were, however, better.

The expenses and labour connected with these exhibitions as held annually are great and fall rather too heavily on many persons who assist at getting them up, and it might be expected that the interest would diminish when these exhibitions had been held for many years consecutively. It was never intended that they should be permanently annual institutions. In the original scheme five annual shows only were to be held, after which it was suggested that such general shows could be held at intervals of three or five years. Seven annual shows have now been held, and it is now proposed to hold them at intervals of not shorter than three years. This, of course, does not preclude in any way a district or state from holding little local exhibitions of rubber or produce of any kind as was too commonly done in previous years. These little local shows were held constantly in Singapore and Penang from 1884, and later in Malacca and the Native States, and were very pleasant little functions.

It has been stated that the big exhibitions have failed in their object, a statement with which we should entirely disagree. The objectors seem to have thought that they were entirely arranged for the benefit of native padi-cultivators or to improve native cultivations only. This we do not think it was ever expected by any of the original proposers of the exhibitions that the padi cultivation would be vastly improved by this or any other method of the type. The effect of these exhibitions has, we believe, been very much greater than is at first visible.

Their importance has been realised so much by other nations that they are being invited in numerous parts of the East. From India to the Philippines there have been from time to time little shows such as we formerly had till the commencement of this series, but it was the Malay peninsula which took the lead in really large and representative exhibitions of produce and trade products, after the style of the large exhibitions in Europe, and as in other progresses in agriculture in this country, our lead is being followed elsewhere.—Ed

DIVISION A.—Agricultural Produce.

1.	Padi, best sample of any named variety	1st	Mat Daus b. Dayong	$15	Malacca	74
	,,	2nd	Peng. Kulop b. Banshi	10	,,	71
	,,	3rd	Putsh b. Khamis	5	Penang	95
1a'	,,	1st	H. Daus b. Hji Mat Saman	8	Penang	43
	,,	2nd	Kulup Abdul Rahman b. Saleh	4	Perak	15
	,,	3rd	Hadji Moh b. H. Abd Rasit	2	Penang	107
1b.	,,	1st	Yeope Shamad Peng Trong	8	Perak	7
	,,	2nd	Sleman Peng Sungie Trap	4	Perak	10
	,,	3rd	Osman b. Hji Syiti	2	Penang	32
1c.	,,	1st	Hadji poh Arshat	8	Penang	29
	,,	2nd	Hadji Darub b. H. Mat	4	Penang	43
	,,	3rd	Osman b. Hji Spihi	2	Penang	32
2.	Pulut, best sample of any named variety	1st	Zobit b. Hji Sallit	10	Penang	31
	,,	2nd	Pamudh	5	Kelantan	64
	,,	3rd	Mohd Hashim b. Said	3	Penang	101
3.	Rice, best sample prepared by machinery.	1st	Hadji poh b. H. Abdull	10	Penang	37
	,,	2nd	Hadji poh b. H. Abd Rasit.	5	Penang	107
	,,	3rd	H. Darus b. H. Mat Saman	3	Penang	43
4.	Rice, best sample prepared in a lesong	1st	Pch b. Awaludin	10	Malacca	21
	,,	2nd	Osman b. H. Spihi	5	Penang	32
	,,	3rd	Poh Rouse	3	Penang	206
5.	Best collection of different Padi in the ear, 10 heads in each sample	1st	Mohd. Hashim b. Said	20	Penang	101
	,,	2nd	H. Draus b. H. Mat Saman	10	Penang	43
	,,	3rd	Zobit b. Hadji Salit	5	Penang	31
6.	Best Padi and Pulut, grown in one mukim to be exhibited by the Penghulu of such mukin and so certified by him (6 Samples)	1st	Mohd. Hashim b. Said	50	Penang	101
	,,	2nd	Ismail b. Mat Taip	25	Penang	13
	,,	3rd	Jusah b. H. Latif	10	Penang	153
15.	Coconut, unhusked, best sample	1st	Hadji Amudin Peng S. Tenggi	5	Perak	5
	,,	2nd	Abdul Wakat Peng S. Raya	3	Perak	60
	,,	3rd	Bagan Datoh Estate	2		

12/233

16. Coconut, husked best sample	1st	Tunku Besar	$5	Kelantan	30
,,	2nd	Mohd. Rouse	3	Penang	206
,,	3rd	Mohd. Tahir	2	Penang	197
17. Coconuts, best bunch	1st	Hadji Amudin Peng S. Tenggi	5	Perak	5
,,	2nd	Mohd. Shahid	3	Penang	170
,, Special.		Tunku Besar	2	Kelantan	31
18. Coconuts, collection of varieties	1st		S. M.	Malacca	30
,,	2nd	Mamad b. Ab: Gham	B. M.	Malacca	32
19. Copra, best sample kiln dried	1st	Malakoff Estate	Cup.	Penang	224
	No Second				
20. Copra, best sample Sun-dried	1st	Malakoff Estate	Cup	Penang	224
,,	2nd	E. J. Unger.	S.M.	Singapore	7
21. Copra, best sample Sun-dried	1st	Chi Tek Yew	Cup	Penang	18
,,	2nd	Malakoff Estate	S.M.	Penang	224
22. Tapioca Roots, best sample	1st	Tanah Merah Estate Ltd	$5	Muar	3A
,,	2nd	Said K. L. Kiri	3	Perak	46
23. Tapioca, Pearl Medium best sample	1st	Malakoff Estate	5	Penang	224
,,	2nd	Merlimau Estate	3	Malacca	35
24. Tapioca, Pearl Seed best sample	1st	Malakoff Estate	5	Penang	224
,,	2nd	The Tepong Estate	3	Singapore	80
25. Tapioca Flake, best sample	1st	Merlimau Estate	5	Malacca	35
,,	2nd	Malakoff Estate	3	Penang	224
26. Tapioca Flour, best sample	1st	Cheae Ah Noh	5	Penang	77
,,	2nd	C. Tuah Choo	3	Penang	208
27. Arrowroot, fresh	1st	Japar b. Hadji Abd. Raman	5	Selangor	68
,,	2nd	Suawi b. Md. Jenus	2	Penang	180
,,	3rd	Harry H. Norris	1	Singapore	10
28. Arrowroot, prepared best sample	1st	Aisha b. H. Hussein	5	Penang	24
,,	2nd	Mat Hassan b. Awang	2	Penang	34
,,	3rd	Malakoff Estate	H.C.	Penang	224
29. Sago Pearl, best sample	1st	Soh Keong Low	$5	Singapore	60
,,	2nd	Teo Hoo Lai	3	Singapore	53
30. Sago Flour, best sample	1st	Chi Tek Yew	5	Penang	18
,,	2nd	Sin Guan Lee	3	Singapore	56
31. Maize, best sample	1st	Hadji Abd. Kady	5	Penang	5
,,	2nd	Kuluf Kamad	3	Perak	32
,,	3rd	Indut	1	Perak	57
,,	H.C.	Milah	H.C.	N. S.	43
32. Ginger, best sample	1st	Raja Ally	$5	Singapore	69
,,	2nd	Mat Sahat b. Omar	3	Penang	84
,,	3rd	Yeong Shew Soon	5	Penang	71

12/
284

33.	Turmeric, best sample	1st	Yeong Chew Soon	$5	Penang	71
	,,	2nd	Hadji Moh. Arsat	3	Penang	29
	,,	3rd	Peng Hasan b. Eting	1	Penang	209
34.	Tuba (akar) best sample	1st	Abubaka b. H. Berhim	5	Penang	21
	,,	2nd	Peng Sam b. H. Saleh	3	Malacca	13
	,,	3rd	Sliman Peng Sungei Trap	1	Perak	10
35.	Sugar Cane, best sample	1st	Harry H. Norris	8	Singapore	12
	,,	2nd	Hadji Mate Saman	5	Penang	139
	,,	3rd	H. Siman b. H. Sakah	3	Malacca	81
36.	Sugar Coconut, best sample	1st		5	Malacca	65
	,,	2nd	Peng Sam b. Saleh	3	Malacca	13
	,,	3rd		1	Selangor	11
	,,	H.C.	Aman b. Mohd	H.C.	Selangor	4
37.	Sugar nipah, best sample	1st	Hashim b. Mhd. Salleh	$5	Penang	11
	,	2nd		3	Penang	87
	,,	3rd	Chi Napbet H. Bakar	1	Penang	72
38.	Sugar kabong, best sample	1st	Chi Mat	5	Penang	96
	,,	2nd	Said H. Mamat b. H. Musah	3	Malacca	8
	,,	3rd	Itam b. Mat	1	Malacca	6
39.	Sugar (cane) brown best sample	1st	D. Podisesgho	S.M.	Perak	83
	,,	2nd	Hadji Moh. b. H. A. Sasat	B.M.	Penang	107
40.	Coffee, Liberian, best sample	1st	Peng Mat Sah	S.M.	Selangor	78
	,,	2nd	Hadji Mustafa	B.M.	Selangor	38
41.	Coffee any other variety	1st	Moh b. Hadj Ismail	S.M.	Penang	40
	,,	2nd	H. Mhd. b. H. Abdula	B.M.	Penang	37
42.	Cocoa, fresh pods, best sample	1st	Peng Abdula Ghain	$5	Malacca	18
	,,	2nd	Moh. Shat	3	N.S.	50
	,,	3rd		3	Penang	86
43.	Toddy, best sample	1st		5	Selangor	7
	,,	2nd	Malakoff Estate	3	Penang	Nil
	,,	3rd	A. T. Govindasamy	3	Singapore	44
44.	Rum, best sample		No Exhibits			
44a.	(Samsoo)	1st	Cheah kee Ee	B.M.	Teluk Anson	
45.	Rum shrub, best sample	1st	Fatimah b. H. Abd. Rasat	S.M.	Penang	103
			(One prize only)			

SECTION IV.—Spices, etc.

46.	Betel Nuts, fresh, best sample	1st	Moh. Marican	$3	Penang	179
	,,	2nd	Some b. Abdul Brahin	2	Penang	68
	,,	3rd	Hadji Dollah b. Brahin	1	Selangor	71

47.	Betel Nuts, dried and split, best sample	1st	Peng Hassan b. Eting	$4	Penang	209
	,,	2nd	Bidi Seputoh Kinta	2	Perak	88
	,,	3rd	Moh. Taha b. Abrahman	1	Malacca	16
48.	Sereh Leaves, best sample	1st		4	Malacca	67
	,,	2nd	Itam b. Mat	2	Malacca	9
	,,	3rd	Moh. Marican	1	Penang	179
49.	Cloves, best sample	1st	Osman b. Isahik	5	Penang	19
	,,	2nd	Wan Chee	3	Penang	213
	,,	3rd	No Exhibit	1		
	,,	H.C.	Yeong Chew San	H.C.	Penang	71
50.	Nutmegs, fresh, best sample	1st	Hamat b. H. Sahat	$5	Penang	210
	,,	2nd	C. Tuah Choo	3	Penang	208
	,,	3rd	Kamuludin b. H. Bahadin	1	Penang	63
	,,	H.C.	Mhd. Ali K. Lawakiri	H.C.	Perak	43
51.	Nutmegs, dried, best sample	1st	Yeong Chew Gan	$5	Penang	71
	,,	2nd	Osman b. Isahit	3	Penang	19
	,,	3rd	Mat Din b. Mat	1	Penang	114
52.	Mace, dried yellow	1st	Osman b. Isahik	4	Penang	19
53.	Mace, dried, red	1st	Law Chit Man	4	Penang	76
	,,	2nd	Yoong Chit Man	3	Penang	71
	,,	3rd	Kamabudin b. H. Baherdin	1	Penang	63
54.	Pepper, white.	1st	Moh. Abas	5	Perak	78
	,,	2nd	Chee Wan Estate	4	Selangor	73
	,,	3rd		3	Malacca	68
55.	Pepper, Black	1st	Chee Woh	5	Selangor	74
	,,	2nd	Arsha b. Hadj Hussin	4	Penang	24
	,,	3rd	Abdul Jubit	3	Selangor	39
56.	Spices, best collection (optional)	1st	Hadji Mat Saman	10	Penang	139
	,,	2nd	Shaik Housan	5	Penang	150
	Special		Hadji Hassan Alwi	5	Penang	25
57.	Patchouli, best sample	1st	Shamad b. Lebai	5	Penang	83
	,,	2nd	Arsit b. Alas.	3	Penang	81
	,,	3rd	Minum	1	Penang	196
			(No prize given)			
58.	Camphor, (Cinnamomum Camphora) best sample	Extra Prize	Haji Ahmed	5	Penang	6

SECTION V.—Oils, Oil Cake, etc.

59.	Oil, Citronella, best sample	1st	Jong London Estate	$8	Perak	59
	,,	2nd	Tampinis Para & Coconut Plantations, Ltd.	4	Singapore	33
60.	Oil, Lemon Grass, best sample	1st	Syed Abdul Rahman	8	Penang	137
	,,	2nd	Wan Chee	4	Perak	77

61. Oil Coconut, best sample	1st	Kung Shean Sung	$10	Penang	125
„	2nd	Singapore Oil Mills	5	Singapore	16
„	3rd	Chi Tek In	3	Penang	18
62. Oil, Gingelly, Teal Seed, best sample	1st	Singapore Oil Mills	5	Singapore	17
„	2nd	M. Naina	3	Penang	52
„	3rd	Shaik Housan	1	Penang	150
63. Oil, Castor, best sample	1st	Singapore Oil Mills	5	Singapere	18
„	2nd	Shaik Housan	3	Penang	150
„	3rd	Hadj Mat Saman	1	Penang	139
64. Oil, Clove, best sample	1st	Singapore Oil Mills (1st prize only)	5	Singapore	19
65. Oil Para Rubber Seed best sample	1st	Singapore Oil Mills	S.M.	Singapore	20
„	2nd	Linggi Plantations	B.M.	N.S.	X
66. Oil, Kabu Kabu Seed best Sample	1st	Singapore Oil Mills (**1st Prize only**)	$5	Singapore	21
67. Oil, any other kind best sample	1st	Singapore Oil Mills	5	Singapore	22
„	2nd	Kung Theam Sung	3	Penang	125
68. Oil Cake, Cocoanut, best sample	1st	Hawthrudon Estate	5	Selangor	A
„	2nd	Singapore Oil Mills	3	Singapore	23
„	3rd		1	Singapore	75
69. Oil, Cake, Para Seed best sample	1st	Linggi Plantation	5	N.S.	X
„	2nd	Singapore Oil Mills	3	Singapore	24
70. Oil, Cake, Kabu Kabu Seed, best sample	1st	Singapore Oil Mills (1st prize only)	5	Singapore	25
70A. Oildake Kabu Kabu Seed, Special Prize for Cakes	Singapore Oil Mills		S.M.		
71. Seed, Kabu Kabu, best sample	1st	Moh. Abb.-Matahil	$5	Penang	26
„	2nd	Sahid b. Sahat	3	Penang	75
„	3rd	Haji Ebrahim b. Hasad	1	Selangor	66
72. Oils, best collection	1st	Singapore Oil Mills	S.M.	Singapore	26
„	2nd	Moh Abas	B.M.	Perak	78

SECTION VI.—Getahs, Gums, etc.

73 Getah Jelutong, best sample	1st	E. J. Unger	$10	Singapore	6
„	2nd	Gimbam	5	N.S.	51
74. Getahs, best collection of local	1st	*Low Ah Jit & Sons	10	Singapore	38
„	2nd	Peng W. Ijok	5	Perak	2
„	3rd	Sliman Peng	2	Perak	10
75. Getah Taban, best sample	1st	*Low Ah Jit & Sons	5	Singapore	40
„	2nd	Rapin	2	Selangor	53

*(Special Prize of $10 or Diploma to Low Ah Jit & Sons for collection models in Gutta Percha)

Note.—Low Ah Jit & Sons wish Silver or Bronze medal not money.

No proper entries but given to Chewing Gambier.

76.	Gambier Cubes	1st	Peng H Rajah	$49	Malacca	
	„	2nd	Syed Ahmat Sel	19		
77.	Gambier Block					
78.	Dragon's Blood, best sample	1st	Abdullah Sirat	5	Perak	21
	„	2nd	Abdul Samat	2	Perak	6
	„	3rd	Sliman Lambar Kiri	1	Perak	62
79.	Gums and Damars, best collection of local	1st	Mohd b. Mat Selleh	7	Penang	14
	„	2nd	Abdul Jebil	3	Selangor	39
	„	3rd	Along Mot Ludin	1	Perak	19

SECTION VII.—Fibres.

80.	Cotton, (Kakabul) best sample	1st	Syed Rahamnfulla	$6	Penang	65
	„	2nd	Chemat b. Chiedin	3	Penang	144
	„	3rd	Tamby Kechil	2	Penang	195
81.	Cotton, any other variety, best sample	1st	Haji Moh b. H. Abb Rasat	6	Penang	107
	„	2nd	Moh Kassim	3	Penang	141
	„	3rd	Sriffen	2		149
82.	Fibres, best collection	1st	Khoo Soo Ee	S.M.	Penang	91
	„	2nd	Salih	B.M.	Malacca	52
	Extra Prize		Sedang Rusat b. Dris	$4	Malacca	36

SECTION VIII.—Miscellaneous.

83.	Rottans, best collection	1st	Syed Ahamad	10	Penang	86
	„	2nd	Che Towe	5	Perak	79
	„	3rd	Sin Taw Choo	3	Perak	25
		Special Prize.	Weng Hong Loong	5	Singapore	2
84.	Bamboos, best collection	1st	Moh Taib	5	Penang	138
	„	2nd	Ujang	2	Selangor	42
	„	3rd	Ahamad b. Bingkus	1	N.S.	9
85.	Walking Sticks, best collection (unprepared)	1st	Tuan Haji Abdul Raman	5	Perak	87
	„	2nd	Moh. b. M. Salleh	3	Penang	14
	„	3rd	Abd. Rahim b. Mohd. Sahid	2	Penang	105
	Special Prize.		Abubakar b. Ahmed	5	Singapore	1
86.	Medicinal Plants, best collection (open)	1st	Shaik Ismail	S.M.	Penang	87
	„	2nd	Said K. L. Kiri	B.M.	Perak	46
	Extra Prize		Peng Moh Rais	$4		

87.	Medicinal Plants, best collection (Natives only)	1st	Mohd. Abas	$8	Perak	78
	,,	2nd	Mat Mor b. Ahmat	4	Penang	28

DIVISION B.

JUDGES AWARDS.

88.	Aroids	Tan Joo Chin	1st	Prize
		Teo Kong Hin	2nd	,,
89.	Aroid Specimen	Tan Boon Teck	1st	,,
		Mrs. Bidwell	2nd	,,
90.	Caladiums	Tan Joo Chin	1st	,
		Teo Kong Hin	2nd	,,
91.	Caladium-Specimen	Tan Joo Chin	1st	,,
		Teo Kong Hin	2nd	,,
94.	Crotons	R.A.G. Bidwell	1st	,,
		F. E. Jago	2nd	,
95.	Croton-Specimen	Teo Kong Hin	1st	,,
		Tan Boon Teck	2nd	,,
96.	Dracaenas	Teo Kong Hin	1st	,,
		J. d' A. Pereira	2nd	,,
97.	Dracaena-Specimen	Teo Kong Hin	1st	,,
98.	Ferns-Any variety	St. V.B. Down	1st	,,
99.	Adiantums	St. V.B. Down	1st	,,
100.	Adiantums	R. A. G. Bidwell	1st	,,
		Mrs. Bidwell	2nd	,,
101.	Fern-Specimen	Mrs. Stuart	1st	,,
		St. V.B. Down	2nd	,,
102.	Marantas	J. d' A. Pereira	2nd	,,
104.	Palms	Tan Joo Chin	1st	,,
		Tan Boon Teck	2nd	,,
105.	Palm-Specimen	J. d' A. Pereira	1st	,,
106.	Panax and Aralia	Tan Joo Chin	1st	,,
107.	Selaginella	J. d' A. Pereira	2nd	,,
109.	Any Ornamental Plants	Teo Kong Hin	Special	
110.	,, Specimen	J. d' A. Pereira	1st	,,
111.	Foliage Plant Specimen	Tan Joo Chin	1st	,,
		J. d' A. Pereira	2nd	,,
113.	Amaranthus	St. V.B. Down	1st	,,
118.	Cannas	Rev. G. Gex	1st	,,
119.	Canna-Specimen	Rev. G. Gex	1st	,,
122.	Dahlias	Tan Joo Chin	1st	,,
		Mrs. Scott	2nd	,,
127.	Orchids	Mrs. Scott	1st	,,
		Mrs. Gad	2nd	,,
128.	Orchid-Specimen	St. V. B. Down	1st	,,
131.	Petunias	Tan Joo Chin	1st	,,
134.	Zinnias	Tan Joo Chin	1st	,,
136.	Best Plant in Flower	E. G. Broadrick	1st	,,
137.	Begonias	Tan Joo Chin	1st	,,
		St. V.B. Down	2nd	,,
138.	Begonia-Specimen	St. V.B. Down	1st	,,

139.	Group of Plants	Tan Joo Chin	1st	Prize
		Mrs. Thomas	2nd	„
143.	Dahlias	Mrs. Scott	2nd	„
144.	Roses	Miss Lloyd	1st	„
145.	Cannas	Rev. G. Gex	1st	„
		Mrs. Scott	2nd	„
146.	Orchids	W.C. Coveney	1st	„
		Mrs. Scott	2nd	„
147.	Bridal or Hand Bouquet	Miss Norris	1st	„
		Miss Lloyd	2nd	„
148.	Cut Flowers	Mrs. Felkin	1st	„
		E.G. Broadrick	2nd	„
149.	Collection of Cut Flowers	Mrs. Stuart	1st	„
		Mrs. Ellis	2nd	„
150.	Table Decoration	Mrs. Salzmann	1st	„
		Misss Ethe Lloyd	2nd	„
		Mrs. Saunders & Miss Gun	3rd	„
		Miss Lloyd	4th	„
151.	Wild Flowers	Miss Lloyd	1st	„
		Mrs. Faston	2nd	„
152.	Button-holes & Sprays	E. Dowland	1st	„
153.	Bananas	Mohd Taha B. Ahdulmanan	1st	„
		Mohamed Salleh	2nd	„
154.	Bananas Best Bunch	Kulup Ahmat	1st	„
		Ahdul Jabil	2nd	„
155.	Champedak	Hassan	1st	„
		H. Nasurdin	2nd	„
156.	Chiku	Yusuf Bin Arshat	1st	„
		Chia Joon Hock	2nd	„
158.	Custard Apple	Miss E.C. Brown	1st	„
		Sidang Mohd Sahat	2nd	„
159.	Cultivated Fruits	Mohd Abas	1st	„
161.	Durian Blanda	Mohd Yusuf	1st	„
162.	Duku	Janudin Bin Abu	1st	„
164.	Jack Fruit	H.H. Norris	1st	„
165.	Jambu	Haji Ismail	1st	„
166.	Langsat	Ramli	1st	„
167.	Limes	Indut Pen Shin	1st	„
		Chein	2nd	„
		Sidang Mamat B. Musah	Special	
168.	Mangoes	Sidang H. Ma' ali	1st	„
169.	Manchang	Sidang Mamat B. Musah	1st	„
170.	Mangosteen	Yusuf B. Arshat	1st	„
171.	Mata Kuching	Yusuf B. Arshat	1st	„
172.	Melon	Chein	1st	„
173.	Papaya	Selangor 9	1st	„
174.	Oranges	Abdul Wahat Peng S.	1st	„
		Raya	2nd	„
175.	Pineapple Kew Variety	Said Alwi	1st	„
		Sidang H. Ma' ali	2nd	„
176.	Pineapples	Penghulu Hasan B. Eting	1st	„
		C. Quah Choo	2nd	„
177.	Pomeloes	Husin B. Sleiman	1st	„
		S. Moorhouse	2nd	„

179.	Rambai	Mun B. Jayah	1st	Prize
		Chemat B. Chedui	2nd	„
180.	Rambutan	Mun B. Jayah	1st	„
		Sahchee	2nd	„
181.	Wild Edible Fruits	Bahari	1st	„
		Peng Japah	2nd	„
182.	Any Kind of Fruit	T.C.B. Miller	1st	„
		Rev. N. J. Couvreur	2nd	„
183.	Artichokes	E. G. Broadrick	1st	„
185.	Benny Fruits	M.Nasurdin	1st	„
186.	Brinjals	Sidang Arshat	1st	„
187.	Beans	Mohd. Yusuf B. Hashim	1st	„
189.	Chillies	Kulup Mohamed	1st	„
190.	Cucumbers	Ahdul Samat	1st	„
191.	Herbs used in Curries	Tan Pong Guan	1st	„
192.	Ladies' Fingers	Chu Cheng Tek	1st	„
193.	Lettuces	E. G. Broadrick	1st	„
195.	Onions etc	Kung Thean Sung	1st	„
196.	Pumpkins	Itam B. Kassim	1st	„
197.	Radishes	Tan Pong Guan	1st	„
199.	Tomatoes	Syed Ahamed	1st	„
200.	European Vegetables	Mrs. Gad	1st	„
201.	Vegetables & Herbs	E. G. Broadrick	1st	„
202.	Water-Melons, etc.	Omar B. Musah	1st	„
		Mohd. Hussian	2nd	„
203.	Yams & Kladis	Mohd. Jusoh B. Hashin	1st	„
		Syed Ahamed	2nd	„
204.	Any Vegetable	Rev. G. Gex	1st	„
		W. Dunman	2nd	„
205.	Preserved Fruits	Sin whatt Hin	1st	„
		Mohd. B. Mohd. Din	2nd	„
		No. 25	3rd	„
207.	Pickles	Mrs. Moorhouse	1st	„
		Mrs. Gad	2nd	„
208.	Jellies	Mrs. Angus	1st	„
		Haji Ismail	2nd	„

DIVISION C.—Stock and Dairy Produce.

SECTION I.—Cattle

209.	Bull	1st	Bruseh H. T. M. Co., (F. Hilton)	Cup & $10	Singapore	46
	„	2nd	Abdul Odood	5	„	110
			Cup presented by Seah Eng Kun, Esq.			
			$10 presented by J. R. Belilios & Co.			
210.	Cow and Calf, (Australian excluded)	1st	Syed Gulab Shah	S.M.	Singapore	18
	„	2nd	Mrs. Morgan	$5	„	37
			1st Prize $10 presented by J. R. Belilios & Co.			
211.	Milch Cow	1st	Mrs. Plumpton	S.M.	„	22
212.	Pair of Draught Bullocks (Siamese)		No Entries			
213.	Pair of Draught Bullocks (Indian)	1st	Not awarded	$10		
	„	2nd	A. T. Govindasamy	5	„	24
			$10 presented by E. G. Broadrick, Esq.,			

214.	Champion Cow in Classes 210-11	Cup	Mrs. Plumpton		Cup	Singapore	22A

Cup presented by W. Patchett, Esq.,

SECTION II.—Buffaloes.

215.	Buffalo Bull	1st	Dasrat	S.M.	,,		17
	,,	2nd	Tongkoo Tomenggong	$5	Kelantan		87
216.	Buffalo Cow	1st	Abdul Odood	S.M.	Singapore		101
	,,	2nd	Tongkoo Tomenggong	$5	Kelantan		88
217.	H. Goat	1st	Mrs. Perreau	S.M.	Singapore		2
	,,	2nd	Tongkoo Tomenggong	$5	Kelantan		89
218.	She Goat with Kids	1st	Sidang Marrat B. Musah	15	Malacca		3
	,,	2nd	F. H. Smith	5	Singapore		5
219.	Ram Sheep	1st	Abdul Odood	S.M	,,		102
	,,	2nd	,,		,,		105

This prize cannot be presented. See Rule 6.

220.	Ewe Sheep	1st	Abdul Odood	S.M.	,,		108
	,,	2nd	,,		,,		106

This prize cannot be presented. See Rule 6.

221.	Pen of four Malay Sheep		No Entries				
222.	Pen of Sheep any other breed		No Entries				
223.	Champion Goat in Classes 217/8		Sidang Marrat B. Musah	S.M.	Malacca		3
224.	Champion Sheep in Classes 219/22		Abdul Odood	S.M.	Singapore		102

SECTION IV.—Pigs.

225, 226, 227, 228 — No prizes awarded

SECTION V.—Poultry.

229.	Bantam Cock & Hen	1st	G. McBreau	B.M. & $5	,,		25
	,,	2nd	Tan Kwee Liang	3	,,		70

1st Prize presented by Dr. Croucher.

230.	Malay Cock & Hen	1st	Haji Mohamed Noh	5	Selangor		61
	,,	2nd	Tongkoo Tomenggong	3	Kelantan		92
231.	Malay Game Cock and Hen	1st	Mat Yusop	5	Perak		6
	,,	2nd	Lim Peng Chin	3	Singapore		85

1st Prize presented by Dr. Croucher.

232.	Chinese Cock & Hen	1st	Mrs. Coveney	5	Singapore		6
	,,	2nd	Not awarded				
233.	Cock & Hen any other breed	1st	Lee Pek Hoon	5	Singapore		47
	,,	2nd	Haji Osman	3	Penang		22
233A.	Best Cock and 2 Hens Houdans	1st	John Lee	10	Singapore		42

Prize presented by the Singapore Poultry Farm

233B.	Plymouth Rocks	1st	W. Madden	$10	Singapore		14

Prize Presented by the Singapore Poultry Farm

233C.	Polish		No Entries				
233D.	Brahmas	1st	Tan Kwee Liang	$10	Singapore		72

Prize presented by the Singapore Poultry Farm.

233E. Orpingtons	1st	Lee Pek Hoon	$10	Singapore	49
Prize presented by the Singapore Poultry Farm.					
233F. Leghorns	1st	Lee Pek Hoon	$10	Singapore	50
Prize presented by the Singapore Poultry Farm.					
233G. Wyandotts	1st	Lee Pek Hoon	$10	Singapore	58
Prize presented by the Singapore Poultry Farm.					
233H. Minorca	1st	Lee Chin Twan	$10	Singapore	78
Prize presented by the Singapore Poultry Farm.					
234. Pen of six fowls for table use	1st	Mata Sudin bin Amah	$10	Malacca	7
,,	2nd	Mat Yusop	5	Perak	6
Prize presented by T. R. Nicholson, Esq.,					
235. Champion Fowl in Classes 229/34		Lee Pek Hoon for Orpington Cock	Cup	Singapore	
Cup presented by A. T. Bryant, Esq.,					
236. Muscovy Duck and Drake	1st	Not awarded	$5		
,,	2nd	Lim Peng Chin	3	Singapore	85
237. Duck & Drake any other breed	1st	John Lee	5	Singapore	43
,,	2nd	Singapore Poultry Farm	3	Singapore	62
238. Gander & Goose	1st	Not awarded	5		
,,	2nd	Jandin Bisi Abu	3	Malacca	8
Special prize for Gander to F. H. Smith			5	Singapore	11
239. Turkey Cock and Hen	1st	Not awarded	5		
,,	2nd	Lim Peng Chin	3	Singapore	87
240. Pair of Pigeons	1st	Singapore Poultry Farm	5	Singapore	63
,,	2nd	John Lee	3	Singapore	44
241. Best Cage bird	1st & 2nd Divided				
		Miss Agnes Hodge	4	Singapore	
		Abdul Shukor B. Gagah	4	Perak	9
242. Best collections of cage birds		No Entries			
243. Rabbits buck and doe	1st	Singapore Poultry Farm	5	Singapore	64
,,	2nd	Tan Boo Liat	3	Singapore	57

SECTION VI.—Dairy Produce.

244. Best sample of butter locally produced	1st	Kung Than Seng	M. & $10	Penang	24
Presented by Dr. Fowlie.					
245. Best sample of milk in bottle	1st	Mrs. Morgan	M. & 10	Singapore	41
246. Best collection of 12 eggs	1st	Singapore Poultry Farm	5	Singapore	65
,,	2nd	Sandak	3	Perak	7
246A. Honey in Comb	1st	Rev. G. Gex	10	Singapore	32
,,	2nd	Not awarded	5		
246B. Honey, Clear	1st	Haji Mat Saman	10	Selangor	62
,,	2nd	Rev. G. Gex	5	Singapore	33

Special Prizes.

Deer	1st	Mrs. Klimmet	$10	Singapore	92
Crown Pigeons	1st	Mrs. Klimmet	5	Singapore	4

Singapore Poultry Farm's Incubators were highly commended by judges.

A. G. HARRINGTON,
Hon. Sec., Division C.

DIVISION E.

Section No. 1.

Class No.		Amount of Prizes.	Winner's No.	Names.	
273	1st	$10	1	Penang	67
	2nd	5	2	"	69
274	1st	5	12	Malacca	22
	2nd	3	17	N. Sembilan	18
275	1st	10	4	Singapore	28
	2nd	5	8	Penang	7
276	1st	5	2	Singapore	16
	2nd	2	11	Perak	17
277	1st	7	3	Penang	82
	2nd	3	6	Penang	107
278	1st	10	6	Kedah	37
	2nd	5	9	Penang	55
279	1st	5 } No award.			
	2nd	3 }			
280	1st	5	10	Kelantan	106 & 107
	2nd	3	7	Penang	82
281	1st	5	47	Perak	33
	2nd	3	59	Perak	18
282	1st	5	28	Perak	19
	2nd	3	29	N. Sembilan	28
283	1st	5	16	Selangor	43
	2nd	3	35	Kelantan	IIIB
284	1st	5	20	Kedah	40
	2nd	3	47	Kelantan	105
285	1st	10	1	Singapore	21
	2nd	5	4	N. Sembilan	64
286	1st	5	2	Selangor	19
	2nd	2	No Prize		
287	1st	5	1	Malacca	5
	2nd	3	5	Kelantan	104
288	1st	10	2	Singapore	11
288	2nd	5	1	Singapore	10
289	1st	10	1	Singapore	13
	2nd	5	3	Penang	7
290	1st	10	1	Singapore	22
	2nd	5	4	Singapore	no number
291	1st	5	1	Singapore	14
	2nd	3			

Section No. 2.

292	1st	10	30	Malacca	51
	2nd	5	32	Singapore	no number
293	1st	10	2	Penang	105
	2nd	5	1	Penang	87

Class No.	Amount of Prizes.		Winner's No.	Names.	
294	1st	$7	14	Perak	6
	2nd	3	15	Perak	33
295	1st	7	4	Malacca	17
	2nd	3	3	Penang	68
296	1st	7	17	Penghulu Bida Perak	41
	2nd	3	2	Penang	38
297	1st	1	10	Perak	43
	2nd	5	11	Perak	47
298	1st	5	1	Perak	3
	2nd	3			
302	1st	10	3	Penang	7
	2nd	5		No Prize	
303	1st	10	17	Perak	20
	2nd	5	15	Kelantan	176/180
304	1st	10	18	Penang	71
	2nd	5	16	Penang	68
305	1st	5	7	Penang	69
	2nd	3	4	Penang	55
306	1st	15	8	Penang	55
	2nd	10	26	Kelantan	119/130

Section No. 3.

299 (*a*)	1st	15	27	Malacca S. Prize	34
	2nd	10	3	Penang S. Prize	2
299 (*b*)	1st	10	38	Perak	9
	2nd	5	39	Perak	10
300 (*a*)	1st	10	51	Punggit G. School	
	2nd	5			
300 (*b*)	1st	5	36	Negri Sembilan	29
	2nd	3	1	Penang	1
300		42	Special Prize	Perak	10
301	1st	10	5	Penang	117
	2nd	5			

Section No. 4.

307	1st	5	7	Perak	42
	2nd	3	2	Penang	86
308	Special	5	5	Malacca	10
				Native Schools awarded to Lewai bin Jampang, Klang	
	1st	5	6	Malacca	11
	2nd	3	18	Negri Sembilan	87
309	1st	10	14	Selangor	58
	2nd	5	5	Penang	127
310	1st	7	13	Negri Sembilan	27
	2nd	5	4	Penang	104
311	1st	5	16	Malacca	37
	2nd	3	24	Perak	1
312	1st	5	4	Penang	91
	2nd	3	14	Perak	31
313	1st	5	5	Negri Sembilan	67
	2nd	3			

12
291

Class No.		Amount of Prizes.	Winner's No.	Names.	
314	1st	45	6	Perak	1
	2nd	3	8	Perak	18
315	1st	15		Not worth a first	
	2nd	10	5	Selangor	18/18

Section No. 5.

316	1st	5	16	Penang	110
	2nd	3	17	Penang	112
317	1st	5	2	Penang	2
	2nd	3	7	Penang	110
318	1st	10	1	Singapore	1
	2nd	5	5	Penang	110
319	1st	5	3	Penang	101
	2nd	3	7	Perak	21
320	1st	5	28	Malacca	20
	2nd	3	16	Penang	72
321	1st	5	4	Penang	129
	2nd	3	7	Perak	19
322	1st	10	11	Perak	48
	2nd	5	12	Perak	49
323	1st	10	} No award.		
	2nd	5			

322 NOTE.—A special prize of $5 was awarded under this class to a Malay chauffer of father somebodys (Singapore) for a model of a steam launch. I cannot remember his name which was put into the official prize list but not noted here.

Section No. 6.

324	1st	5	Schools 858		
	2nd	3	818		
326	1st	7	98 & 255	Perak.	The ticket had both these numbers on it.
	2nd	4	No. IV.		
329	1st	10	550	Perak	
	2nd	5	837		

Section VI.—Malay Schools.

325	1st	10	Schools 20	
	2nd	5	No award	
327	1st	5	Schools 1397	
	2nd	3	Schools 291	
328	1st	10	Schools 530	
	2nd	5	Schools 1252	
330	1st	10	Schools 557	
	2nd	5	Schools 1320	
331	1st	5	Schools 599	
	2nd	3	Schools 28 G	
	Special	5	Schools 1673	decided by ladies for embroidery and fancy work.

Remaining Classes in this Section will be judged by ladies.

Weaving	Special	10	Batang Tiga School (Girls)	

DIVISION F.

332.	1st	Penghulu Esop	$10	Malacca
	2nd	Syed Ahamad	5	Selangor
333.	1st	Syed Ahmad	Cup	Penang
	2nd	Kung Thean Sung	S.M.	Penang
		Presented by Guthrie & Co., Ltd.		
334.	1st	John Little & Co., Ltd.,	Cup	Singapore
	2nd	McAlister & Co., Ltd.,	S.M.	Singapore
		Presented by Riley Hargreaves & Co., Ltd.		
335.	1st	John Little & Co., Ltd.,	S.M.	
		No Second	B.M.	
337.	1st	McAlister & Co., Ltd.	$10	
		No Second	5	
338.	1st	Borneo Co., Ltd.,	10	
		No Second	5	
339.	1st	Riley Hargreaves & Co., Ltd.,	G.M.	
	2nd	Howarth Erskine, Ltd.,	Cup	
		Presented by Tan Khean Hock.		
340.	1st	McAlister & Co., Ltd.,	S.M.	
	2nd	John Little & Co., Ltd.,	B.M.	
341.	1st	R. Morton	$10	Singapore
	2nd	A. T. Govindasamy	5	Singapore
342.	1st	Haji Osman	Cup	Penang
	2nd	Tan Oon Peng Saiong	B.M.	Perak
343.	1st	Syed Ahmad	$10	Penang
	2nd	Guthrie & Co., Ltd.,	5	Singapore
344.	1st	Ang Guan	10	Penang
	2nd	Syed Ahmad	5	Penang
345.	1st	Guthrie & Co., Ltd.,	10	
		No Second	5	
346.	1st	Syed Ahmad	10	Penang
	2nd	Abdul Jalil	5	Selangor
		Ibrahim C. Abdul Hamid	S.P.	Penang
347.	1st	Ah Seng	$10	Penang
	2nd	No Second	5	
348.	1st	Ah Seng	10	Penang
	2nd	Syed Ahmad	5	Penang
350.	1st	Wee Kay Siang	S.M.	Singapore
		No other exhibit	S.M.	
352.	1st	R. Morton		Singapore
		No other exhibit	S.M.	
354.	1st	John Little & Co., Ltd.,	Cup	
		No Second	B.M.	
355.	1st	F. Clark & Co.,	$10	
		No other exhibit	5	
357	1st	Sidang Dris b. Hasan	10	Malacca
	2nd	Tuan Haji Abdul Rahman	5	Perak
		Nunuameah	S.P.	Perak

SMOKED RUBBER.

We have the pleasure of presenting the following report on some Para rubber smoked on spindles in the Botanic Gardens and sent to Messrs. Gow-Wilson and Stanton for examination and report. It will be noticed that the report is not made by a broker, but by a manufacturer who has treated it from a manufacturer's point of view, the only view that is really valuable.

For some time we have been working and experimenting with various methods of smoking latex with a view of making Plantation rubber if possible as closely resembling Fine Hard Cure Para of the Amazons as could be.

Fine Hard is considered the best class of rubber in the world, and very superior to ordinary Plantation rubber in tensile strength and power of recovery, but at the same time as ordinarily sent to market is less clear than Plantation rubber, which was why it often fetched a lower price.

To make them a rubber which possessed all the best qualities of Fine Hard cure and the purity of Plantation was the object of this series of experiments. From time to time the reports of the examination of these samples prepared in this way have been published in the Bulletin and in the last annual report, but some of these reports did not satisfy the experimenters. However, it appeared clear we were on the right track and the work was carried on, and the present report now submitted to our readers is a most encouraging one, and shows that we are within a measurable distance of making a very superior class of Rubber equal to Hard fine Para, but cleaner.

Further experiments are in progress and we hope soon to be able to show that Plantation rubber by proper treatment of the latex can be made equal if not superior in every respect to the finest rubber produced in the Amazons.

Further, we do not think that the method employed will prove to be any more expensive than the ordinary making of sheet or crepe but on the contrary may possibly be made even cheaper.

H. N. RIDLEY, ESQ.,
Director, Botanic Gardens,
Singapore, S. S.

Dear Sir,

We are in receipt of your favour of the 30th June, and have just heard from Messrs. Beck and Pollitzer that the 10 cases Rubber referred to by you have duly arrived. We hope to forward you full report on the condition and quality of these samples shortly.

Meanwhile, we have received from the manufacturer who had undertaken the experiment with the previous sample of Smoked Para cured on the lines of Hard Fine Para which you had sent us, his report on the subject, and enclose herewith extract from same.

We think you will agree that this is in most respects extremely satisfactory, far more so in fact than the physical properties of the samples before manufacture appeared to warrant.

It is of course more and more clear that the important matter in handling plantation rubber is the vulcanising, and we trust that the opinions our friends have formed after these experiments will be confirmed after more prolonged tests.

We are, Dear Sir,
Yours faithfully,
for Gow, Wilson & Stanton Ltd.,
SPENCER BRETT,
Managing Director.

EXTRACT.

Para Rubber from Singapore Botanical Gardens.—With reference to your letter of October 20th sending a small sample of Smoke Cured Para Rubber from the Singapore Botanical Gardens prepared exactly on the same lines as Hard Fine Para, we have tested this rubber and compared it with Hard Fine with the following results:—

	Hard Fine Para	*Singapore Botanical Gardens Smoke Cured Para.*
	%	%
Loss in washing	18	13.
Resin	3.5	5.11
Organic Matter	1.5	2.03
Ash	0.25	0.38

In quality and general behaviour, this rubber is extremely like Hard Fine Para in tensile strength and in power of recovery, but is slightly softer and requires a different vulcanising heat.

The elasticity and tensile strength for the period covered by the experiments show that at the proper vulcanising heat, it is as durable as Para. We will, however, make periodical tests in order to confirm this fact over a longer period

PEAT SOILS.

Mr. Schirmer sends some correspondence and analysis of soils in Johore which may interest some. It is on the peat soil especially that his Sisal hemp and other fibres have grown in so striking a manner.

The interesting point of the analysis of the peat soil lies in its close resemblance in chemical constituents to that of an analysis from another source given previously in the Bulletin.

One could hardly agree however with Mr. Baur as to the peat soil being well suited for rubber from a chemical standpoint: and it is still less so from a physiological standpoint as pointed out in

a previous Bulletin dealing with this subject. The contrasts between the constituents of the soils in the Botanic Gardens where the rubber grows superbly and that of the soil mentioned by Mr. Baur as well suited for rubber is very striking. For comparison I select two soils on which the biggest trees in the Gardens are growing and where the development and rapid growth is the greatest, No. 1, a more peaty soil on which grew the celebrated tree, No. 2, and No. 6 on which grew the tree which attained a height of 100 feet in 14 years.

	Botanic Gardens		Peat Soil
	1	6	
Organic matter	34,000	11,800	88,060
Oxide iron	2,000	6,200	500
Oxide alumina	23,602	51,280	559
Silicates	32,000	74,000	2,860

In the Garden soils the amount of organic matter is a little more than the silicates in the most peaty; and less than one sixth of the proportion of silicates in the more clayey soil. In the Johore peat soil there is more than forty times as much organic matter than mineral 88 per cent. against 34 and 11.8 in the good rubber gound. Could there be any greater difference between the soils?

It is always satisfactory to have analysis of soils on which cultivation is going on and which can be watched, as by this we can learn gradually the effect of abnormal and normal soils on the plants growing therein.—Ed.

Copy.

The Manager, Colombo, 19th August, 1910.
Sungei Peradin Estate,
Kukub, Johore.

Dear Sir,

With reference to your letter of the 28th June, advising me of two samples of soil from the above estate, I have much pleasure in informing you that the same have been carefully analysed by my agricultural expert, and I am now enclosing a report on the soil, which I have no doubt you will find very interesting.

As regards the mixtures recommended to you the same can be supplied at the following rates, viz:—

Mixture for Peaty Soil.—At £10. 0. 0. per ton. gross weight cif Singapore.

Mixture for Clayey Soil.—At £9.15.0 per ton. gross weight cif Singapore. Documents against payment.

I should be glad to hear from you whether you have an intention of going in for manuring, as recommended by me, and in the meantime.

I beg to remain,
Dear Sir,
Yours faithfully,
(Sd.) A. BAUR.

Colombo, 16th August, 1910.

Sungei Peradin,
Kukub Estate, Johore.

Peat: Surface Soil.—This is a dark brown soil and composed entirely of decaying vegetable matter including decomposing wood. It is very acid, and when dry is in a fine state of division. Chemically it is exceedingly rich in Nitrogen and plant food generally with the exception of Potash which, however, is in fair amount.

Clay: Sub-Soil.—This is a compact grey clayey mud, which dries very slowly and forms a hard mass, but this becomes friable on moistening. It is in a fine state of division, rich in Nitrogen and Potash, but a little deficient in Lime and Phosphoric Acid.

The soil is well suited for Rubber from a chemical standpoint, but a great depth of peat means some risk of loss from disease and more from the trees falling over as the peat contracts. I would advise close drainage gradually increasing the depth and spreading the material dug from the drains over the roots of the trees, so as to keep them covered.

Owing to the marked acidity the application of ground or burnt Lime at least 5 cwts. per acre is advisable, and the following manure could be applied to supply any deficiency until the drying of the soil and cultivation renders the reserve plant food more available.

PEATY SOIL.

100	lbs.	Sulphate of Potash, 50% potash
100	„	Precipitated: Phosphate 40% Phos. Acid
150	„	Nitrate of soda, 15% nitrogen
200	„	Ground Lime, 98% carbonate of lime
550	lbs.	

CLAYEY SOIL.

100	lbs.	Sulphate of Ammonia, 20% Nitrogen.
100	„	Sulphate of Potash, 50% Potash.
200	„	Precipitated Phosphate, 40% Phos. Acid.
150	„	Ground Lime, 98% Carbonate of Lime.
550	lbs.	

The careful burning of stumps on the clayey soil is advisable, as the Ash will do good, and it will minimise the risk of fomes, etc. On the peat it is too dangerous; but if an acre of waste peat could be isolated where the peat could be burned, the resulting ash could be an excellent manure both on the peat and clay soils, though it must not be applied at more than 5 cwts. per acre at one time.

Coconuts would probably do excellently in these soils if planted deep enough and well drained.

(Sd.) A. BAUR,

Colombo, 15th August, 1910.

Estate	Kukub-Sungei Peradin Estate
District	Johore
Product	Rubber
Soil Samples	Two

MECHANICAL COMPOSITION.

	PEATY SOIL.	CLAYEY SOIL.
Fine soil passing 90 mesh ...	44.00%	52.00%
Fine soil passing 60 mesh ...	56.00%	48.00%
Medium soil passing 30 mesh ...	...	...
Coarse sand and small stones ...	...	...
	100.00	100.00

CHEMICAL COMPOSITION.

Moisture	7.000 %	3.000 %
Organic matter & combined water	88.060 „	25.200 „
Oxide of iron and manganese ...	0.500 „	1.600 „
Oxide of alumina	0.559 „	6.390 „
Lime	0.600 „	0.120 „
Magnesia	0.216 „	0.288 „
Potash	0.076 „	0.138 „
Phosphoric acid	0.128 „	0.064 „
Sand and Silicates	2.860 „	63.200 „
	100.000	100.000
Containing Nitrogen	1.800 „	0.450 „
Equal to Ammonia	2.180 „	0.550 „
Lower Oxide of iron	Fair	Fair
Acidity	Marked	Marked

PERSONAL.

Mr. C. K. Bancroft has joined the Department of Agriculture as Assistant Mycologist. He obtained a Barbados Scholarship in the West Indies in 1905 and proceeded to Cambridge where he took the Natural Science Course obtaining his B. A. with 1st Class Honours, and 2nd Class Honours in Botany in the Tripos Part II. In 1908 he also won the Major Scholarship at Trinity College. After leaving Cambridge he worked for nearly 18 months at Kew under Mr. G. Massee, the great British authority on fungus diseases, being engaged principally in the study of tropical fungi.

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

15th to 31st July.

	Steamers.		Tons.	Tons.
Tin	Str Singapore & Penang	to U. Kingdom &/or	1691	1821
Do.	do.	U.S.A.	525	495
Do.	do.	Continent	305	210
Gambier	Singapore	Glasgow	—	—
Do.	do.	London	—	35
Do.	do.	Liverpool	160	35
Do.	do.	U.K. &/or Continent	—	70
Cube Gambier	do.	United Kingdom	25	20
Black Pepper	do.	do.	—	95
Do.	Penang	do.	55	—
White Pepper	Singapore	do.	70	100
Do.	Penang	do.	5	—
Pearl Sago	Singapore	do.	10	260
Sago Flour	do.	London	75	100
Do.	do.	Liverpool	1,200	575
Do.	do.	Glasgow	50	—
Tapioca Flake	Singapore	United Kingdom	360	175
T. Pearl & Bullet	do.	do.	45	100
Tapioca Flour	Penang	do.	50	350
Gutta Percha	Singapore	do.	150	150
Buffalo hides	do.	do.	110	90
Pineapples	do.	do.	30,000	15,500
Gambier	do.	U.S.A.	225	375
Cube Gambier	do.	do.	55	30
Black Pepper	do.	do.	150	210
Do.	Penang	do.	—	160
White Pepper	Singapore	do.	55	210
Do.	Penang	do.	—	55
Tapioca Pearl	Singapore	do.	120	150
Nutmegs	Singapore & Penang	do.	11	48
Sago Flour	Singapore	do.	75	250
Pineapples	do.	do.	1,750	1,000
Do.	do.	Continent	3,250	4,000
Gambier	do.	S. Continent	—	55
Do.	do.	N. Continent	700	200
Cube Gambier	do.	Continent	5	50
Black Pepper	do.	S. Continent	200	125
Do.	do.	N. Continent	210	45
Do.	Penang	S. Continent	10	30
Do.	do.	N. Continent	—	—
White Pepper	Singapore	S. Continent	15	10
Do.	do.	N. Continent	75	60
Do.	Penang	S. Continent	5	—
Do.	do.	N. Continent	5	40
Copra	Singapore & Penang	Marseilles	660	240
Do.	do.	Odessa	—	1,950
Do.	do.	Other S. Continent	540	100
Do.	do.	N. Continent	3,660	1,350
Sago Flour	Singapore	Continent	1,300	750
Tapioca Flake	do.	do.	10	75
Do. Pearl	do.	do.	—	10
Do. Flake	do.	U.S.A.	50	—
Do. do.	Penang	U.K.	—	—
Do. Pearl & Bullet	do.	do.	110	125
Do. Flake	do.	U.S.A.	—	—

			Tons.	Tons.
	Steamer.			
Do. Pearl	do.	do.	55	325
Do. Flake	do.	Continent	35	—
Do. Pearl	do.	do.	160	25
Copra	Singapore & Penang	England	360	—
Gutta Percha	Singapore	Continent	20	35
Cube Gambier	do.	do.	—	—
T. Flake & Pearl	do.	do.	—	—
Sago Flour	do.	do.	—	—
Gambier	do.	S. Continent	—	—
Copra	do.	Marseilles	—	—
Black Pepper	do.	S. Continent	—	—
White Pepper	do.	do.	—	—
Do.	do.	U.S.A.	—	—
Pineapples	do.	do.	—	—
Nutmegs	do.	do.	—	—
Black Pepper	do.	do.	—	—
Do.	Penang	do.	—	—
White Pepper	do.	do.	—	—
T. Flake & Pearl	do.	do.	—	—
Nutmegs	do.	do.	—	—
Tons Gambier			1,100	650
Do. Black Pepper			70	150

PENANG.

Abstract of Meteorological Readings in the Prison Hospital Penang for the month of August, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
Prison Hospital Penang	29.860	154.3	82.3	89.8	73.4	16.4	77.7	.894	74.7	80.8	S.E.	13.10	2.80

Prison Hospital, Penang,
14th September, 1910.

B. DANE.
Senior Medical Officer, Penang.

NEGRI SEMBILAN.

Abstract of Meteorological Readings in Negri Sembilan Hospitals for the month of August, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Seremban		149.4	81	86	71	15	75.9	.806	72.7	76.8	W	6.33	1.54
Mantin												6.99	2.13
Tampin												10.50	1.80
Kuala Pilah												3.24	.43
Jelebu												3.76	1.43
Port Dickson Town												20.79	3.73
Do. B. B.												15.21	3.35

MEDICAL OFFICER IN CHARGE'S OFFICE,
SEREMBAN *15th September, 1910.*

A. J. M. MOSLEY,
Medical Officer in Charge.

SELANGOR.

Abstract of Meteorological Readings in the various Districts of the State for the month of August, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
General Hospital, Kuala Lumpur ...	29.855	147.5	81.5	88.8	72.5	16.3	76.2	0.814	72.9	76	Calm.	4.36	1.20
Pudoh Gaol „ „	...	...	...	...	...	...	...	...	...	...	...	6.58	2.07
District Hospital „	...	...	...	...	...	...	...	...	...	...	...	4.03	1.20
„ Klang	...	...	...	91.0	69.8	21.2	...	...	...	...	...	2.07	0.48
„ Kuala Langat ...	...	...	...	87.7	73.5	14.2	...	...	...	...	...	8.49	1.85
„ Kajang	...	...	...	84.9	75.1	9.8	...	...	...	...	...	7.55	1.53
„ Kuala Selangor ...	...	...	...	87.3	74.9	12.4	...	...	...	...	...	6.52	1.35
„ Kuala Kubu	...	...	...	92.5	70.2	22.3	...	...	...	...	...	11.41	1.27
„ Serendah	...	...	...	92.6	70.5	22.1	...	...	...	...	...	5.64	1.64
„ Rawang	...	...	...	90.4	70.8	19.6	...	...	...	...	...	2.70	0.58
Sabak Bernam	...	...	...	...	...	...	...	...	...	...	...	1.36	0.30

OFFICE OF SENIOR MEDICAL OFFICER,
Kuala Lumpur, 20th September, 1910.

G. D. FREER,
Senior Medical Officer, Selangor.

PERAK.

Abstract of Meteorological Readings in Perak for the month of August, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taiping	...	109	82.61	94	70	24	77.63	880	...	79	...	7.36	2.00
Kuala Kangsar	...	...	80.50	93	69	24	75.61	820	...	78	...	2.95	.72
Batu Gajah	...	104	80.83	92	72	20	76.79	866	...	82	...	4.60	2.88
Gopeng	...	...	81.14	91	71	20	75.46	806	...	76	...	4.44	.87
Ipoh	...	...	80.93	92	70	22	76.65	861	...	82	...	4.82	1.67
Kampar	...	...	81.14	93	70	23	76.02	830	...	78	...	5.31	2.43
Teluk Anson	...	...	81.70	91	70	21	76.80	855	...	78	...	3.61	.97
Tapah	...	...	81.14	91	68	23	76.24	837	...	78	...	6.17	1.51
Parit Buntar	...	...	82.41	91	71	20	76.92	852	...	77	...	6.06	1.02
Bagan Serai	...	...	82.30	91	71	20	76.91	854	...	78	...	5.45	2.50
Selama	...	...	80.56	91	72	19	75.92	835	...	80	...	9.08	2.21

Office of Senior Medical Officer,

Ipoh, 14th September, 1910.

S. Lucy,

Senior Medical Officer, Perak.

KELANTAN.

Abstract of Meteorological Readings in Kelantan for the month of August, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° F.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	%		Ins.	Ins.
Kota Bharu ...	...	151.5	82.5	87.8	74.3	13.5	76.7	.820	73.3	72.0	...	6.79	1.33
* Kuala Lebir ...	...	...	79.2	89.7	72.2	17.5	75.7	.823	73.4	78.6	...	11.42	3.28
Kuala Kelantan ...	...	...	...	78.84	74.23	4.61	...	...	...	...	...	3.40	1·15
Kuala Pahi ...	...	...	...	85.61	72.0	13.61	...	...	...	...	...	8.61	2.52
Taku Plantation ...	...	...	...	...	...	...	...	...	...	...	...	9.63	1.75
Nenggiri ...	...	...	...	...	...	...	...	...	...	...	...	6.65	1.51
Pasir Tinggi ...	...	...	...	...	...	...	...	...	...	...	...	11.25	2.72
Chaning Estate ...	...	...	...	...	...	...	...	...	...	...	...	5.78	.98

* Supplied by the courtesy of the Kelantan Planters' Association.

Residency Surgeon's Office.
Kota Bharu, *26th September, 1910.*

John D. Gimlette,
Residency Surgeon,
Kelantan.

SEREMBAN.

Table showing the Daily Results of the Reading of Mëteorological Observation taken at the General Hospital, Seremban, for the month of August 1910.

Date.	Temperature of Radiation.						Temp. of Radiation.		Wind Direction.		Temp. of Evaporation.			Computed Vapour Tension			Relative Humidity.			Clouds 0 to 10			Cloud and Weather Initials.			Rain.
	9 H.	15 H.	Mean.	Maximum.	Minimum.	Range.	Sun.	Difference Sun & Shade.	9 H.	15 H.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H.	21 H.	9 H.	15 H.	21 H.	Inches.
1	79	85	82.	88	72	16	145	57	W	W	72.3	71.8	72.	.793	.781	.787	80	64	72	9	0	0	N	S	S	
2	81	85	83.	87	69	18	151	64	N W	S W	72.6	73.4	73.	.802	.826	.814	76	68	72	0	0	0	S	S	S	.24
3	75	85	80.	86	72	14	147	61	N W	S W	73.3	70.1	71.7	.820	.738	.779	94	61	77.5	0	0	0	S	S	S	1.54
4	75	80	77.5	81	71	10	148	67	W	S W	73.3	73.3	73.3	.820	.820	.820	94	80	87	0	5	0	S	C	S	
5	78	82	80.	84	70	14	137	53	W	S W	74.6	72.	73.3	.857	.785	.821	89	72	80.5	4	0	0	C	S	S	
6	79	85	82.	88	72	16	154	66	W	W	75.6	73.4	74.5	.887	.826	.856	90	68	79	0	0	0	S	S	S	
7	81	88	84.5	90	71	19	150	60	S W	W	74.3	73.3	73.8	.849	.819	.834	80	61	70.5	0	0	0	S	S	S	
8	82	86	84.	88	70	18	151	63	S W	S W	75.3	69.5	72 4	.877	.721	.799	80	58	69	0	0	0	S	S	S	
9	82	83	82.5	86	71	15	151	65	W	S	75.3	71.3	73.3	.877	.766	.821	80	68	74	0	0	0	S	S	S	
10	80	83	81.5	87	70	17	154	67	W	W	71.6	74.7	75.1	.775	.856	.815	75	76	75.5	0	0	0	S	S	S	.61
11	76	82	79.	84	72	12	146	62	W	W	72.6	70.3	74.4	.801	.742	.771	89	68	78.5	3	4	0	S	C	S	
12	77	85	81.	86	70	16	155	69	N W	W	73.6	71.8	72.7	.829	.781	.805	89	64	76.5	0	0	0	S	S	S	
13	80	87	83.5	89	71	18	150	61	N W	W	73.3	73.9	73.6	.820	.837	.828	80	65	72.5	0	0	0	S	S	S	
14	75	83	79.	85	72	13	155	70	W	W	73.3	71.3	72.3	.820	.766	.793	94	68	81	7	0	0	N	S	S	.44
15	77	79	78.	82	73	9	134	52	W	S W	73.6	73.9	73.7	.829	.839	.834	89	85	87	4	3	0	C	S	S	
16	79	85	82.	86	71	15	144	58	W	S W	73.9	71.8	72.8	.839	.781	.810	85	64	74.5	0	0	0	S	S	S	
17	75	84	79 5	85	70	15	156	71	W	S W	73.3	70.7	72.	.820	.751	.785	94	64	79	5	0	0	C	S	S	
18	76	84	80.	86	72	14	153	67	N W	S W	74.3	74.	74.1	.848	.840	.844	94	72	83	4	5	0	C	C	S	.68
19	78	81	79.5	86	73	13	150	64	N W	S W	72.9	76.	74.4	.810	.897	.853	84	85	84.5	0	7	0	S	N	S	.04
20	78	83	80 5	85	72	13	138	53	W	S W	72.9	71.3	72.1	.810	.766	.788	84	68	76	6	10	5	C	N	C	.55
21	80	84	82.	86	70	16	156	70	N W	S W	73.3	74.	73.6	.820	.840	.830	80	72	76	0	3	2	S	S	S	
22	74	76	75.	84	72	12	151	67	W	N W	74.	74.3	74.1	.840	.848	.844	100	94	97	8	9	0	N	N	S	1.33
23	80	86	83.	87	71	16	150	63	N	S W	73.3	72.8	73.	.820	.808	.814	80	64	72	0	0	0	S	S	S	
24	81	84	82.5	87	71	16	151	64	N W	S W	70.9	72.4	71.6	.757	.794	.775	72	68	70	0	0	5	S	S	C	.95
25	79	86	82.5	87	72	15	156	69	N E	W	72.3	74.5	73.4	.793	.855	.824	80	68	74	4	0	0	C	S	S	.25
26	77	87	82.	87	70	17	155	68	N W	S W	71.9	67.3	69.6	.783	.669	.726	84	52	68	5	2	4	C	S	C	
27	75	85	80.	86	70	16	145	59	S W	S W	73.3	66.8	70.	.820	.660	.740	94	55	74.5	5	6	5	C	C	C	
28	76	86	81.	87	70	17	150	63	N W	S W	74.3	67.9	71.1	.848	.681	.764	94	55	74.5	2	4	0	S	C	S	
29	76	85	80.5	86	70	16	152	66	S W	S W	72.6	70.1	71.3	.801	.738	.769	89	61	75	8	6	3	N	C	S	.30
30	76	84	80.	86	70	16	148	62	S W	S W	72.6	70.7	71.6	.801	.751	.776	89	64	76.5	7	4	2	N	C	S	
31	82	85	83.5	86	71	15	149	63	S W	S W	75.3	75.1	75.2	.877	.873	.875	80	72	76	2	1	0	S	S	S	
Mean.	78	84	81.	86	71	15	149.4	63.3	W	S W	73.3	72.	72.7	.824	.788	.806	85.8	67.9	76.8							6.33

Seremban,
15th September, 1910.

Highest Temperature 90
Lowest Temperature 69

Greatest Rainfall in 24 hours 1.45

A. J. M. CLOVELY,
Senior Medical Officer in charge.

No. 11.] NOVEMBER, 1910. Vol. IX.

Agricultural Bulletin

OF THE

STRAITS

AND

FEDERATED MALAY STATES.

EDITED BY

H. N. RIDLEY, M.A., F.R.S., F.L.S., F.R.H.S.

Director of Botanic Gardens, S.S.

From the first of January, 1910

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AGRICULTURAL BULLETIN

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No. 11.] NOVEMBER, 1910. [Vol. IX

CHILIS AS A CATCH-CROP.

The demand for Chilis or capsicums by natives for local consumption is very large. They are used both fresh and dry, and the chief source of supply of dried Chilis in the Malay Peninsula is India, whence very large quantities are exported to Singapore and Penang. It seems absurd that in a country like this we cannot grow all the Chilis we require for local consumption, but not only have we, it seems, ever been able to supply a sufficiency of dried Chilis, for the demand, but during the past two or three years fresh chilis have been so scanty that the price had gone up from 6 to 10 cents a catty to 40 to 50 cents a catty.

The reasons for their scarcity in Singapore are several. During the past few years, it is said by the Chinese, that the weather has been bad, too much rain at the wrong time, so that the Chilis rot. This rot is due to a fungus attacking the fruit of which I will give an account later, and no doubt excessive wet would increase the development of this pest. Another reason for the scarcity is the fact that large areas of ground which were formerly vegetable gardens have been converted into rubber estates. Chilis and other vegetables could, of course, be grown as catch-crops at least in the early years between the rubber trees with benefit both to the trees and to the planter, but somehow this is not done. The Chinese also affirm that vegetables cannot be grown without manure, of which they hold night-soil the best. Objections have been raised to growing vegetables with night-soil anywhere near town for sanitary reasons, and the result has been a notable scarcity of vegetables, all of which are now very expensive. Indeed, we are informed such vegetables as pumpkins, brinjals, cabbage, etc., are at prices which are prohibitive to the poorer classes. With these cultivations Chilis, which, also require in our poor soil a good deal of manure, have also risen very high in price. Vegetables,

including Chilis, are an absolute necessity for the health of rice-eating peoples, who require large quantities of them, and it is a question worthy of study by those who are interested in the health of the population as to whether the failure of the vegetable supply does not produce an insanitary condition which is of considerable importance and possibly even greater than the risk from using night-soil on such vegetables, at least as brinjals, pumpkins, beans and Chilis. The Chilis cultivated are chiefly the *Capsicum frutescens*, or *Capsicum annuum*, the long cylindrical red fruit commonly known as capsicums of the long Cayenne variety.

There are a considerable number of varieties of this plant, many of which are rather fancy kinds, which are cultivated more as curiosities, or from fancy, such as the black or yellow fruited varieties, but for trade purposes the important one is the long Cayenne.

The bird's eye Chili, *Capsicum Minimum*, is much used by natives also, but sufficient is cultivated usually in their gardens or in waste ground and it does not seem to form a vegetable garden crop as the long capsicum does, though it would be easy enough to cultivate it so. It is not popular among the Indian races, and is chiefly used by Javanese and Malays. It is, as is well known, much more pungent than the long Cayenne and is commonly used as a pickle or for making a very hot sauce.

For market-purposes the long pepper is the one in demand, both fresh and dry, and for making Cayenne pepper.

The Capsicum is usually grown as an annual and replanted each year, but it can be continuously cultivated for two or three years, the stems and branches being cut back each year. They, however, are useless after the second or at least the third year and require replanting from seed. They cannot be grown continuously on the same soil, as they deteriorate, and consequently require rotating with other crops, such as brinjals, beans, or some other annual crop. This is the way the Chinese usually grow them.

In Singapore the soil in which they are cultivated is usually stiff clay, well worked up. If procurable, manure, such as cow-dung, should be worked into it, and burnt earth is added.

The seeds taken from fresh-pods are soaked in salt fish water, that is water in which salt fish has been soaked. In this liquid they remain for a week. They are then taken out and dried well and mixed with soft earth. The object of these proceedings is to separate the seeds and free them of pulp, so as to be able to sow them at a distance from each other in the seed bed, otherwise they would cling together and be planted in a lump.

They are sown in a nursery bed and after fifty days pricked off into the permanent plot. The beds in the plot are fifty feet in length and three feet in width, and a foot apart, so that the planter can walk between the plants and weed them. A five foot-way runs between each block of beds.

The soil of the beds is worked up fine and banked up, and two holes are made on either side of the bed about 1½ to 2 feet apart, giving from 50 to 60 plants to a bed. Cow-dung is put in each hole and the plants are planted therein and soil raked over the cow-dung to the bases of the plants. Liquid manure is given once a week, or oftener. Urine is often used in the proportions of three parts of urine to two of water when the plants are young and two parts of urine to three of water later. Pig-dung is also used when procurable; over manuring is to be avoided, but the plants can take a good deal of liquid manure. The weeds have to be removed from the beds from time to time. Plants commence fruiting in three months and go on bearing for seven more. The fruit are picked when fully red, unless green capsicums are wanted for pickling.

Excessive rain in injurious, and often spoils the crop to a considerable extent. The actual cause of this is a fungus which attacks the pod and which is most prevalent in continued rainy weather. The fungus is a species of *Gloeosporium (G. piperatum)*, a plant allied to, if not the same, as the ripe sort of apples. It causes brown spots of decay, firm to the feel, eventually developing pinkish pustules, becoming black.

The common Capsicum fungus in Singapore is either this species described by Tubeuf or an allied one. It appears as an oval or circular blotch gradually spreading, at first black, but as the tissue destroyed dries, brown with a black edge. The epidermis is cracked dry and elevated, finally the whole fruit dries up and is worthless.

The diseased pods should be removed, and the plants and ground disinfected with Bordeaux mixture.

It is not easy to discover what amount of pods can be obtained per acre in the Straits Settlements, as the Chinese are very vague upon this point. In Montserrat, in the West Indies, a return of 4850 lbs. of fresh capsicums, 2921 lbs. when dry, is given as a good return, but this seems much too high for an average return. As a catch-crop they ought to pay well in the neighbourhood of a town or a largely populated native district, where they could be sold fresh.

In Singapore dried Chilis are seldom prepared, unless when the crop is large or there is an overstock. They are dried in the sun, exposed on mats or in trays. Locally-dried Chilis, however, are not popular with the natives here, probably from carelessness in drying and the absence often of enough sunheat. It is possible also to dry them with fire heat or in a desiccator and I have seen good samples prepared by careful heating over a fire.

The native, however, does not seem to care about kiln dried Chilis preferring sun-dried, still, there should be a fair sale for well prepared samples; near market there would probably be a better sale for the fresh fruit, and in such a locality it might pay very well to grow Chilis as a catch-crop.—ED.

12/304

DISINFECTION OF RUBBER SEEDS.

The question of the possibility of introduction of the spores or mycelium of the various fungi attacking Para rubber on the seeds of the rubber tree has been the subject of much discussion at the Chambre d'Agriculture de La Cochin Chine at Saigon, and the subject of disinfection by chemicals discussed.

The smooth seed of the Para rubber, I do not think, could retain spores, but should there be any fragment of soil attached to them spores could be carried, the subsequent washing or soaking in water that seeds should receive on arrival from some distance to facilitate their germination should however remove any possible risk.

M. Morange thinks that there is always a risk in seeds picked up and not disinfected, and as to mycelium he urges that if seeds of Para rubber are piled in a heap and left they go mouldy and this mould is a mycelium growing on the seeds.

Para rubber seends, if left in a pile, become heated very quickly, in fact commence a chemical decomposition, the polished surface of the seed is rapidly destroyed and the thin outer layers broken up so that the mould can then attack the seed. But it is not assumed that rotten seed is imported and carefully planted by a rational planter. Would a planter sow a Hevea seed covered with the very conspicuous mycelium of *Fomes*? and should a fragment of mycelium of *Fomes* be buried with the seed what are the chances of its being planted in actual contact with dying shrub or tree on which it could continue to develop? Besides, even supposing the seed had not been exposed to the light and heat of the sun which in a few minutes would certainly kill the mycelium, the chances of survival of the mycelium threads are very small indeed.

A fungus to establish itself requires a good deal more than importation of one or two spores, or a scrap of mycelium. It requires to be brought and put in such a position that it can actually then and there continue its growth luxuriantly, the actual chance of this in most cases is extremely small, otherwise we should utterly fail to keep out any fungus that happened to be suited for growth on any particular crop.

Fungus spores can be borne by the wind to any distance and doubtless are, but wide as the distribution of these air-borne cellular plants is, many quite fail to effect a settlement in many places. Nothing that man can do can prevent this method of invasion. What we can do is to prevent infected, that is diseased plants, from being brought in and planted among healthy ones of the same kind.

Fomes semitostus is not yet recorded for Cochin China, but the mycology of that country is quite unknown at present, and it may be there all the while. However the agriculturists of Cochin China are taking care not to let it or any other fungus-pest be imported which is prudent. For this object the importation of Hevea-plants is

strictly forbidden and the seeds must be disinfected with Bordeaux mixture or some such disinfectant. One planter having alleged that such disinfection would kill the seed, M. Morange made a series of experiments with bichloride of mercury, and copper sulphate with the following result:

1. Bichloride of Mercury 1 per 1,000

   A. Seeds washed after treatment Proportion of seeds which germinated after 30 days ... 70%

   B. Seeds not washed 68%

2. Bichloride 2 per 1,000
   washed 84
   not washed 90

3. Sulphate of copper 1 per cent,
   washed after ... 62%
   not washed 52%

4. Sulphate of copper 5 per cent.
   washed 68%
   not washed 62%

Check experiment, Seeds washed in pure water gave 78, and 70% germinated after 30 days

The seeds were put in the disinfectant for half an hour.

Except in one case there is a slight proportion of larger germination in the washed over the unwashed seeds, and there is a fall off in germination in the seeds treated with copper sulphate but not a very large one compared with the check experiments.

Another experiment was made by M. Belland—400 seeds were plunged in water and left for half an hour; all germinated

500 were put in a solution of 1 per cent. of copper sulphate for half an hour and continuously stirred round (brassées) energetically for half an hour. Of these only 38 germinated.

500 were similarly treated with a solution of bichloride of mercury 1 per 1,000, only fifty four germinated.

M. Morange made also an experiment of the same nature.

Five hundred seeds were sown dry without washing and 285, i. e. 56.8 per cent. germinated in a month.

Another lot were stirred in plain water more carefully, of these 213. or 42. 6 per cent. germinated.

Another lot was stirred in copper sulphate solution 2 per cent and 291 or 58. 2 per cent. germinated.

A fourth lot were stirred in Bichloride of Mercury at 2 per 1,000, of these 285 or 59 per cent. grew.

It is clear from these experiments that stirring the seeds round in the liquid, whether water or copper sulphate solution, is extremely injurious.

The best disinfectant results as far as germination is concerned appear to be from the use of bichloride of mercury in weak solution, and washing afterwards without stirring the seeds round.

This solution might, however, not be strong enough to thoroughly disinfect the seeds, assuming they were covered by spores.

Personally I think the risk of importing seeds with spores of rubber-killing fungi is infinitesimal. Supposing, for instance, one rubbed a seed with spores of Fomes and planted it in the nursery. The spores would not last indefinitely and it would be probably two years before the plants in the nursery would be old enough to be attacked. It is in the highest degree improbable that any of the spores would germinate at all under the circumstances. In the case of *Diplodia* the risk would be still smaller, as *Diplodia* requires to be put on the cut end of a shoot to make a successful growth. As I have pointed out till decomposition of the exterior of the shell of the seed sets in the spores could hardly rest on the smooth surface, and would even, if attached by mud etc., or included in the packing, be washed away by ordinary plunging in water and probably by the first rain also.

The case is quite different with stumps or plantlets infected being brought into the estate. Here the fungus is established in a thriving state on the young plant, and can go on developing there. It is put in contact with healthy plants in the same conditions of life perhaps even thumb-nail pruned or with buds wounded in some away. By planting infected spore producing plants in such a healthy lot, a planter would be putting the fungus in the best possible position for its development.

The fungi belonging to the group *Polyporei* are extremely abundant all over the tropics and it is very unlikely that *Fomes semitostus* is the only one that can adapt itself to attack Para rubber. Indeed we know that *Irpex flavus* which used to give trouble with coffee can attack Para rubber. Tubenf records thirty species of Polyporei as fatally attacking trees in Europe and North America in the same way as *Fomes* has taken to attacking Hevea, and as far as one can see any at least of the larger *Polyporei* in the Tropics could adapt themselves to attack Hevea. In Christmas Island I and others collected eleven species of Polyporei, and there are probably a great many more to be found in wetter seasons. How did these get to this isolated island? Some at least by spores blown for 250 miles from the nearest land, but a number of the wood-destroying fungi were undoubtedly brought in planks, poles, firewood, old boxes, etc. It is absolutely impossible to prevent this. A bit of firewood on arrival at the port is found to be rotten, i. e., it contains mycelium. It is naturally thrown away, the mycelium continues to grow, and produces its sporophores. Other rotting timber is lying round its spores attack that and

Charduar Rubber Plantation.

Tenders are invited for the purchase of the Charduar Government Rubber plantation (including buildings) situated in the Darrang District, Eastern Bengal and Assam. The plantation, which would be leased on periodic lease, covers about 3,000 acres of which 1,700 acres are fully and 1,047 acres partially stocked with Ficus Elastica trees (between 25,000 and 30,000 in number.)

A contiguous area of 2,000 acres would if desirable be leased on favourable terms for extensions. A memorandum giving full particulars of the estate and conditions of tender and sale can be obtained from the Conservator of Forests, Western Circle, Eastern Bengal and Assam, or from Messrs. GRINDLAY & CO., 51 Parliament Street, London, S. W. Tenders, which will be treated as confidential, should be accompanied by a deposit of Rs. 1,000 and should reach the undersigned not later than the 1st December, 1910. The Local Government does not bind itself to accept the highest or any tender.

A. V. MONRO,
Conservator of Forests, W. Circle,
Eastern Bengal and Assam.

SHILLONG,
23rd July, 1910.

the fungus is established. We cannot stop this but we can prevent the introduction of plants infected by a fungus which has adapted itself so as to be parasitic on any plant we are cultivating, and its being put in contact with other healthy plants of the same kind, and this is or should be the object aimed at by all legislation against the introduction of fungus pests.

One of the difficulties in carrying out the disinfection laws of the various countries seems to be due to the smallness or incompetence of the staff. A case of plants sent from Singapore to an island where the laws were stringent was entirely destroyed by the disinfecting process, entailing a great loss on the importer. Another planter complains that the delay in disinfecting and inspecting is so great that the plants are half dead when they arrive at his estate. In some countries formerly, at least, no plants of any kind were allowed to be imported, preventing thereby any progress in agriculture at all. It should not be difficult to prevent the importation of sick plants without discouraging the importer of new strains or new species of useful plants which may be of the greatest value in the future to his country. At the same time, in the case of any disease of a cultivated plant appearing it should be possible and compulsory for the planter to report to a scientific staff who could take steps to prevent the disease increasing or being spread by sending infected plants from one estate to another. As so many of our plant diseases are of local origin I hold this system to be actually of more importance than preventing accidental introduction of the pest from outside, which is none the less a point not to be lost sight of.—Ed.

A NOTE ON SOME RECENT FUNGUS LITERATURE.

Bulletin No. 65, Vol. IX, of the Department of Agriculture of Trinidad contains, among other interesting articles, an admirable account of some recent investigation on pod-rot, chupon-wilt and canker of cacao by Mr. J. B. Rorer, the Mycologist to the Department.

In the first part of the work the author deals with the history of pod-rot and canker, mentioning Harrison's report (1895) on a disease which occurred in Grenada, Surinam and British Guiana and which was undoubtedly pod-rot, and describing Willis' and Green's report (1897) on "canker" of cacao in Ceylon, thus showing that the first accurate descriptions of pod-rot and canker came respectively from the West and from the East. He next describes Carruthers' work in Ceylon (1898) in which the pod disease was attributed to one of the *Peronosporaceae* and the canker to a species of *Nectria* which was afterwards identified as *N. ditissima*, Tul.; he mentions Howard's work in Grenada (1901) o na pad disease of cacao caused by *Diplodia cacaoicola*, P. Henn., and on a canker disease of the stem which was attributed to two fungi named by Massee *Nectria Theobromae* and *Calonectria flavida*; he points out that Hart was the first to make

pure cultures of *Phytophthora omnivora*, De Bary, and with them to reproduce the pod disease by inoculation ; and finally, he refers to the work of Mrs. Van Hall in Surinam (1909) on the canker disease which was said to be caused by *Spicaria colorans*, n. sp. Having thus described the work of previous investigators on pod disease and canker of cacao, the author is careful to point out that whereas pod disease has been shown by inoculation experiments with pure cultures to be caused by *Phytophthora omnivora*, the canker has never been reproduced by infection with spores derived from pure cultures.

A description of the life-history of *Phytophthora omnivora*, is given, being based on the results of infection experiments. The fungus is shown to be capable of penetrating the unbroken surface of a pod either through the epidermis or through a stoma. When the tissues of the pod have become invaded by the fungus the mycelium is said to pass backwards to the cushion and to produce a cankered appearance of the cushions and of the surrounding area of the bark. Other infection experiments showed that the fungus could spread from the stem to the pods.

A careful description is given of the inoculation experiments carried out with the following species:— *Phytophthora omnivora*, *Diplodia cacaoicola*. *Nectria Theobromae*, *Nectria Bainii*, *Calonectria flavida*, *Spicaria colorans*, and two species of *Sphaerostilbe*. Positive results were obtained only with *Phytophthora omnivora and Diplodia cacaoicola*, and only in the case of the former was the cankered appearance of the stem produced. The author, therefore, concludes that the canker is caused by *Phytophthora omnivora*, and that the other species of fungi mentioned above, with the exception of *Diplodia cacaoicola*, are incapable of affecting the healthy tissues of the plant. The infection experiments were numerous and in each case a pure culture of the fungus was employed.

The remedial measures which are recommended for treatment of the canker and pod disease are :—

(1). Spraying the pods with a fungicide, in which experiments are said to be in progress for the purpose of determining the best fungicide and the most suitable time of application.

(2). Cutting out the cankered area on the stem.

(3). Avoiding needless wounding of trees and unnecessary shading.

(4). Better drainage.

Phytophthora omnivora occurs as parasite wherever the cacao plant is cultivated; but it has hitherto been supposed to be confined to the pods, causing a disease known in the West Indies as "black pod-rot." The author's conclusion that the canker and pod-rot are caused by the same fungus is, therefore, contradictory to the results obtained by previous investigators. His work is, however, accurately

described and the conclusions are based on the results of numerous experiments; it is, therefore, of the greatest importance not only because it throws so much light on the cacao diseases of the West Indies, but because it concerns all cacao-producing countries of the world.

KEITH BANCROFT,
Assistant Mycologist,
to the
Federated Malay States.

PROGRESS IN UGANDA.

The report of the Botanical Forestry and Scientific Department of Uganda for the year ending March 31, 1909, is published as an annual report, and shows a good deal of energy has been expended and good work done. The staff of Europeans is a large one, contrasting very favourably with that of many of the colonies of the Empire. Besides Mr. Dawe, the Director, there is one assistant, one Inspector and five assistants to deal with cotton, and one entomologist, besides several overseers of outlying experimental stations. A big exhibition of many thousand exhibits was held at Kampala which seems to have been a success.

All kinds of useful plants are being cultivated by the department, though cotton is the most important from all points of view. Para rubber is being grown with success and though most of the trees are young tapping experiments were made. The yields, however, seem small, and tapping can apparently be carried on for 8 months only, commencing in the wet season. The growth of the trees, however, is not below the average, the oldest tree, 7½ years old, measures 42½ feet in height and 30 inches in girth. It increased in height 5 feet 9¾ inches, and in girth 5½ inches in the year.

Castilloa is attacked by a borer, and does not promise so well.

Cocoa is being taken up by settlers, Coffee crops well and heavily, but a new leaf disease, *Colletotrichum Coffeoe*, destroyed one plantation. Its attacks, however, were defeated by Bordeaux mixture. Wheat and rice and lemon-grass are successfully worked. Much attention is paid to the cotton industry and the outturn of ginned cotton has risen from 858 cwts. in 1905-6 to 14,087 in 1908-9. There is much too little cotton ground in the Empire for the need of the country so that it is of the greatest importance that areas in which cotton can be successfully grown should be developed to their utmost. It is well suited too to the native population, and is quite the thing for a country with a large native population, and considering the large and increasing area under rubber at the present time is of more importance to the Empire than that popular plant.—ED.

RUBBER IN JAMAICA.

The Director of Agriculture of Jamaica publishes in his annual report an account of the failure to cultivate Para rubber in that island. His remarks on the subject in the previous report occasioned a good deal of comment and criticism, and it was stated that his pessimistic views had a material effect in preventing the rubber boom from extending in Jamaica. His evidence that he now produces seems certainly to justify his condemnation of the cultivation.

The first plants of Hevea braziliensis he says were planted as Castilla in 1872. This is interesting because the first plants imported, by Collins, arrived at Kew in 1873, Where did these plants come from? Did Collins leave some at Jamaica on his return from the Amazon? One of these trees, still standing, and consequently 38 years old, only measures 43½ inches in girth at three feet from the ground and produces with difficulty only a little scrap. Six tappings on a thorough going scale only yielded 4 ounces of rubber per year. In the Straits a tree of this age should be at least 120 inches round, and give 30 to 40 pounds of rubber, and produce over a thousand seeds.

This tree is not the only failure, for reports have been sent in from twelve other localities in Jamaica, all giving the same verdict, "Trees weak and spindly", and in some yield of latex very poor. One correspondent states: "From what I saw of Para rubber in Singapore and Ceylon last summer (1909) I am quite convinced that it is no good here as the girth of my largest tree (four years old) is not as big as one of eighteen months growth in Singapore."

The seeds seem to have germinated fairly well as in 1906. Mr. Fawcett writes that of 7,500 "we shall hardly lose 500." one unlucky lot from an estate sent there however came to grief. In 1905, 5,642 plants were distributed to planters from a lot of 10,000 seeds sent from the gardens in Singapore, but if this was all that germinated this was under the usual germination for seed to Guiana, etc., 86 to 90 per cent. an equally long voyage.

The evidence now brought forward by the Director seems to be conclnsive. The plant has been tried everywhere in Jamaica, and the Department has given it a good trial. The result has been uniformly the same, for some reason the tree will not grow and if it does, produces little or no latex.

More hope is entertained about Castilloa, but there it is reported that under favourable conditions trees of ten years old produce but one pound of rubber, and trees of 14 to 20 years of age 2 lbs. and over. This seems a very poor return. Should rubber fall, as it certainly will do in a few years, to a low figure, it can hardly pay on this return especially as the labour in Jamaica costs four times as much as in the Straits Settlements.

Fruit, Coconuts, and Cocoa seem to be the most successful products in Jamaica.—ED.

EUTYPA CAULIVORA.

Two excellent photographs of this fungus (of which some account was given in the Bulletin IX. p. 216-218) are published in the Kew Bulletin No. 7, 1910, by M. Massee, who writes as follows :

" Other species of Eutypa as *E. erumpens Mass*, and *E. gigaspora* Mass, are distinctive parasites to timber trees and undoubtedly *caulivora* is a tree parasite, though the fruit of the fungus only appears on the trunk when the tree is dead. A section of the trunk shows the dark lines formed by the mycelium of the fungus extending quite to the centre and proves that in the example under consideration the fungus has been present in the tissues for some considerable time previous to the death of the tree. Death ensued from starvation owing to the water supply from the root being checked by the copious development of the mycelium in the water conducting tissue. It is highly probable that the fungus occurs on indigenous trees and has passed from thence to the cultivated rubber trees which, judging from the materials received, prove to be admirabiy adapted to meet the requirements of the parasite. A careful search for this fungus in indigenous trees should be made and its extermination attempted if discovered in localities where the establishment of a rubber plantation is contemplated."

I have found the Eutypa also on cut logs of *Macaranga Griffithii*, a common tree of the class called Mahang by Malays, and an ally at least of Para rubber being one of the *Euphorbiaceae* and which is probably the original host of the *Eutypa*.—ED.

LOCAL FLOWER POTS MAKING.

It is perhaps well-known to everyone, that the Chinese were really one of the pioneers in the art of pottery, and so a short resumé as to their method of making flower-pots may not be amiss.

Very few implements are used by them in the process, and it is really surprising at the rapidity by which they cast out of a shapeless mass of clay, a 5, 10, or 12 inch pot, as the case may be.

Clay, i.e., ordinary local clay, is the substance used, to which is added some fine silver sand also got locally. These two substances are thoroughly mixed together by chankol (native spade) and by hand.

A good " potter's wheel " is the essential part of the equipment. This consists of a large flat disc of stone which revolves on a wooden pivot (made of Tembusu) sunk in the ground. This disc is revolved at a good speed by the foot of a Chinaman, who whisks it round and round according to the needs of another coolie, the later performing the actual operation of moulding the clay into the shape of pots.

When the clay and sand has been prepared to the necessary consistency, a piece of about 5 lbs. is cut off which is sufficient for a 10 pot. The base of this roundshaped lump is dabbed in burnt paddy husk, thereby preventing the base from cracking during subsequent operations and also causing the lump to adhere to the surface of the "wheel."

The wheel is now set agoing by a few vigorous whisks. A little water is then sprinkled over the lump and the Chinaman (No. 2), who by the way squats himself on the ground, also wets his hands to prevent the clay from sticking to them.

His left hand is gently thrust into the centre of the clay while his right hand is slightly pressing on the outside to keep the whole together, but it is from the inside that most of the shaping is done, meanwhile the "wheel" is made to turn more quickly. Then by keeping both hands opposite each other, i.e., one inside and one outside, together moving slowly up from the wheel, pressure by both hands is exerted, and the shapeless mass of clay assumes the shape of a pot with astonishing rapidity. A thin piece of wood is used to flaten the rim and usually the same piece is used to measure the pot to see if it is to the correct size. If not, then a little more pressure is given from the base upwards, but they seldom require to alter it, for it is usually exact, so used are they to the process. So quick are those two coolies at it, that they will mould 2 10 inch pots in 3 minutes.

The holes in the base of the pot are punched out with a piece of tin as are also the holes necessary for orchid pots. These newly made pots are then set in the sun for one day, and are then placed in an oven arrangement where they are "fired." The operation of firing takes 4 days to complete.

Throughout the whole operation, the coolies display an ingenuity which surprises all who have the pleasure of seeing them at work.

J. W. ANDERSON.

TWO PARA RUBBER FUNGI.

In the Ceylon circulars, Vol. 5, No. 6 and 8, Mr. Petch describes two fungi attacking the roots of Para rubber, viz., *Hymenochoete noxia* Berk and *Sphoerostilbe repens* B. and B. The first mentioned is called by him Brown root disease and has been already mentioned in the Bulletin (July 1909). It attacks all kinds of tress, rubber, cocoa, tea, dadap, cotton, cinnamons, cocoa and other plants. It is the commonest root disease in Ceylon, but is by no means as common as Fomes is, here. It is not as injurious as the latter fungus as it spreads very slowly and only along the roots of the trees, and does not affect neighbouring trees, unless the roots are in actual contact. Usually, therefore, one tree is killed at each centre of infection unless the dead tree is left standing for two or three years.

The trees die in the ordinary way that they do from other root diseases, the leaves wither and fall off and the whole tree dies. The characteristic feature of the fungus is seen on digging up the roots, which, and especially the top root, are encrusted with a mass of stones, earth, and sand. This is cemented to the root by the mycelium which consists of tawny brown threads collected here and there into nodules. The mycelium in a young stage brown becomes black later forming a continuous black layer over the brown masses of, hyphae (The brown mycelium coating has a shining appearance and suggests a thin layer of brown plush, whence here we call it the brown plush fungus). On scraping away the fungus, the bark is found to be decayed and usually coloured brown ; the wood, if affected, is yellow, but this depends to some extent on the tree attacked. In Hevea it is usually discoloured and rotten, and wedges of decayed tissue brown and powdery, are seen penetrating to the centre from the outside (In a specimen of Hevea root sent to the editor some years ago the wood was not altered but remarkably dry and hard, as if it had lost all its water by drying).

The fructification is rarely met with. It consists of a patch of a finely velvety appearance covered with minute projecting bristles. It ppears not to be produced till the tree has been long dead.

In Ceylon it appears that nearly all the Heveas attacked have been planted in old Cacao land which had been cleared for planting Hevea, as Cacao is the tree most affected by *Hymenochaete*. That the growth of the fungus is slow is evidenced by the fact that in a row of Heveas fourteen feet apart, and eight years old, one tree having been affected and died, it was two years before the next in the row succumbed, and another two years before the third in the row died.

A root fungus with so slow a progress as this should easily be cleared out if it appears. To dig out the diseased tree completely and fork in lime would probably prevent any further danger.

Mr. Petch gives figures of a shrub and a Hevea root attacked by Hymenochoete, showing the characteristic clinging of the sand. He also mentions and figures a curious destruction of timber by another species, *Hymenochete rigidula,* in which the wood in decay has remarkable honeycombed appearance. This I have found in our forests rarely, chiefly in Seraya timber (Shorea) which has lain rotting in wet spots.

Sphoerostilbe repens B. and Br. This parasite on Hevea roots has been found in about a dozen cases killing Para Rubber in Ceylon. In most cases it seems to have attacked trees in swampy soil, but has killed trees in average plantation soil. In the first noticed case three trees in a patch of undrained sour soil between a set of coolie lines and a factory where the surface roots were constantly being damaged were killed. The ground was used for storing firewood and probably the fungus was brought in on jungle billets. It occurs up to 2,000 feet in Ceylon. The mycelium is easily recognised. When the root is

dug up the bark is decayed but there is no mycelium on the outside. Beneath the bark, however, black or red flattened strands are to be seen running over the surface of the wood, at first red outside and white inside, but as the root decays they decay, too, and turn black.

The mycelium enters the smaller roots and creeping up to the big roots spreads out in this manner.

The fructification is very smaller and of two kinds, the Conidial form is consisting of short red stalks with white globose heads ½ to ⅓ of an inch tall, and an ascigerous form of small cone shaped bodies on the mycelium strands.

This fungus was first found on Jack-trees obviously as a saprophyte, but it has also been found as a parasite on rhizomes of arrowroot. As it develops freely on Jackwood, even on chips, it is necessary to destroy all stumps of such trees and remove the bits left during cutting up. Good figures are given of this fungus. We have not yet heard of the pest yet in the Malay peninsula but a lookout should be kept for it.—ED.

SUGAR PLANTING IN NEGROS.

The Sugar industry of the island of Negros in the Philippine islands forms the subject of an extensive monograph by Herbert S. Walker, of the Government Sugar Laboratory of Iloilo. There have been, it appears, at least two large volumes on the Sugar industry here published, but these official reports, it is said are, full of exaggerated conjectures and estimates so as to be valueless. The present monograph has been written from carefully compiled statistics with analyses, and accurate information obtained from planters and others throughout the islands. The author spent 6 months on the island of Negros taking with him a portable laboratory for the analyses of the canes, sugar and products of the mill and analyses of soil were also made and add to our information on the subject. Negros produces a very large proportion of the Sugar made in the Philippines from forty to fifty per cent. of the whole output. In 1893 the island produced 115,000 metric tons out of 300,000 produced by the whole Archipelago. It has the advantage too of being remarkably free from sugar pests, the only fungus met with was *Ustilago Sacchari* of which there was an outbreak in 1908, but which was easily dealt with. A beetle attacking the roots, a moth whose caterpillar bored the stem and a coccid are practically the only insect-pests, and seem not to be very troublous.

At present the planter grows and manufactures his sugar and puts it on the market himself, but it is pointed out that much advantage is to be derived from having central mills which would take the cane from the planter and manufacture the sugar, so that the planter would be able to devote his whole time to the cultivation and

thus the cultivation could be improved, while the output of sugar would be increased (to ascertain extent at least). More, it is suggested, might be done in the matter of soil fertilisation which it would seem has been somewhat neglected. The crops could be improved by the utilisation or the mill refuse, animal manure and green soiling with crops and commercial fertilisers could be used. Cane is an exhausting crop and what is taken from the soil should be, if possible, replaced, if the ground is to last for a long period.

Ploughing is done by single buffaloes, and this ploughing does not go deep enough. Steam ploughs are suggested but are too expensive for the ordinary planter. A combination of planters might perhaps get round this difficulty.

The adoption of modern methods as noted above would probably put the industry on a very sound footing and allow of further developments.

The monograph is illustrated with a number of photographs, and two of the old systems of ploughing by buffaloes, and of a steam plough with disc ploughs attached illustrate the difference between old-fashioned systems and modern methods. Negros does not appear to possess the advantage of canals through the fields which we possess in Province Wellesley, but has to transport its cane by tramways worked by men and the buffalo-cart, and the photographs of factories show a simplicity of apparatus which is in great contrast with the fine machinery of Caledonia and other estates. Some of the mills only are run by steam, others by water-power or by buffaloes, these latter are disappearing and steam mills are coming into general use, and to an Englishman it is satisfactory to learn that "the steam mills are practically all of English or Scotch origin."

The literature of Sugar cultivation and manufacture is probably the most extensive of any of the literatures of tropical economics, and the supply of statistics of returns, analyses of produce and soils is the largest of any of these products, but the last word on sugar cultivation has not yet been spoken, and in this monograph we have an important and interesting contribution to the study of the Sugar industry.—ED.

A LARGE SOURSOP.

(*To the Editor, The Agricultural Bulletin*).

Sir,

Yesterday I picked a durian blanda fruit which weighed 9¾lbs. Is this a record weight? The tree is a very fine one growing on flat land behind my bathroom. As a rule, it fruits very little, the fruits being small.

Kota Tinggi, October, 9. Yours, etc.,

TOO LATE FOR THE SHOW.

(Can anyone beat this record?—ED).

COCONUT TREES ATTACKED BY A COCCID.

A portion of a leaf of a coconut palm attacked by a Coccid in immense abundance was sent from Kelantan to the Botanic Gardens. The whole of the leaflets were covered on the underside with a vast number of the insects which were in the form of circular brown hats ; the biggest about $\frac{1}{16}$ of an inch across. There were about 800 of them of various sizes to a square inch of the leaf. The sender writes that some of the trees first showed signs of the sickness some ten or twelve days previously and it seems to have spread fairly quickly over a small part, the leaves turning red and dying.

A blight like this is apt to be very troublesome on coconut of the immense abundance of the insect and its very rapid reproduction.

As it seems to dry up and become easily detached when adult, it is quite possible that it could be carried from one tree to another by puffs of wind, conveying eggs with it and so might spread rapidly.

In such cases as these the first and obviously the first thing to do is to cut off the infected leaves and burn them at once. A palm will usually stand the removal of nearly all its leaves, so that a large proportion may be removed safely. The rest should be sprayed or washed down with kerosine emulsion, made with kerosine and soft soap.

After an attack of blight like this it is very advisable to manure the affected trees to assist them in recovering their strength.—ED.

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

15th to 31st July.

	Steamers.		Tons.	Tons.
Tin	Str Singapore & Penang	to U. Kingdom &/or	1691	1821
Do.	do.	U.S.A.	525	495
Do.	do.	Continent	305	210
Gambier	Singapore	Glasgow	—	—
Do.	do.	London	—	35
Do.	do.	Liverpool	160	35
Do.	do.	U.K. &/or Continent	—	70
Cube Gambier	do.	United Kingdom	25	20
Black Pepper	do.	do.	—	95
Do.	Penang	do.	55	—
White Pepper	Singapore	do.	70	100
Do.	Penang	do.	5	—
Pearl Sago	Singapore	do.	10	260
Sago Flour	do.	London	75	100
Do.	do.	Liverpool	1,200	575
Do.	do.	Glasgow	50	—
Tapioca Flake	Singapore	United Kingdom	360	175
T. Pearl & Bullet	do.	do.	45	100
Tapioca Flour	Penang	do.	50	350
Gutta Percha	Singapore	do.	150	150
Buffalo hides	do.	do.	110	90
Pineapples	do.	do.	30,000	15,500
Gambier	do.	U.S.A.	225	375
Cube Gambier	do.	do.	55	30
Black Pepper	do.	do.	150	210
Do.	Penang	do.	—	160
White Pepper	Singapore	do.	55	210
Do.	Penang	do.	—	55
Tapioca Pearl	Singapore	do.	120	150
Nutmegs	Singapore & Penang	do.	11	48
Sago Flour	Singapore	do.	75	250
Pineapples	do.	do.	1,750	1,000
Do.	do.	Continent	3,250	4,000
Gambier	do.	S. Continent	—	55
Do.	do.	N. Continent	700	200
Cube Gambier	do.	Continent	5	50
Black Pepper	do.	S. Continent	200	125
Do.	do.	N. Continent	210	45
Do.	Penang	S. Continent	10	30
Do.	do.	N. Continent	—	—
White Pepper	Singapore	S. Continent	15	10
Do.	do.	N. Continent	75	60
Do.	Penang	S. Continent	5	—
Do.	do.	N. Continent	5	40
Copra	Singapore & Penang	Marseilles	660	240
Do.	do.	Odessa	—	1,950
Do.	do.	Other S. Continent	540	100
Do.	do.	N. Continent	3,660	1,350
Sago Flour	Singapore	Continent	1,300	750
Tapioca Flake	do.	do.	10	75
Do. Pearl	do.	do.	—	10
Do. Flake	do.	U.S.A.	50	—
Do. do.	Penang	U.K.	—	—
Do. Pearl & Bullet	do.	do.	110	125
Do. Flake	do.	U.S.A.	—	—

	Steamer.		Tons.	Tons.
Do. Pearl	do.	do.	55	325
Do. Flake	do.	Continent	35	—
Do. Pearl	do.	do.	160	25
Copra	Singapore & Penang	England	360	—
Gutta Percha	Singapore	Continent	20	35
Cube Gambier	do.	do.	—	—
T. Flake & Pearl	do.	do.	—	—
Sago Flour	do.	do.	—	—
Gambier	do.	S. Continent	—	—
Copra	do.	Marseilles	—	—
Black Pepper	do.	S. Continent	—	—
White Pepper	do.	do.	—	—
Do.	do.	U.S.A.	—	—
Pineapples	do.	do.	—	—
Nutmegs	do.	do.	—	—
Black Pepper	do.	do.	—	—
Do.	Penang	do.	—	—
White Pepper	do.	do.	—	—
T. Flake & Pearl	do.	do.	—	—
Nutmegs	do.	do.	—	—
Tons Gambier			1,100	650
Do. Black Pepper			70	150

SINGAPORE MARKET REPORT,

July, 1916.

Articles.	Quantity sold.	Highest price.	Lowest price.
	Tons.	$ c.	$ c.
Copra	6,820	10 10	9 25
Gambier Bale	1,775	11 72½	11 40
„ Cube No. 1 and 2 ...	240	14 45	14 62½
Gutta Percha 1st quality	...	350 00	300 00
„ Medium	...	240 00	120 00
„ Lower	...	100 00	26 00
Gutta Jelotong	...	14 00	11 00
Nutmegs, 110 s.	...	17 50	17 00
„ 80 s.	...	24 50	23 25
Mace, Banda	...	100 00	90 00
„ Amboina	...	82 00	78 00
Black Pepper	143	13 75	13 50
White Pepper	430	26 25	24 87½
Sago Pearl Small	270	5 25	4 50
„ Medium	40	...	...
Sago Flour, No. 1	4,485	3 60	3 00
„ 2	25	80	77
Tapioca Flake, Small	824	6 45	6 00
„ Medium	85	...	...
„ Pearl, Small	392	7 37½	6 00
„ Medium	507	6 45	6 25
Tin	2,632	75 55	74 32½

PENANG.

Abstract of Meteorological Readings in the Prison Observatory, Penang, for the month of September, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ins.	°	°	°	°	°	°	°	°	%		Ins.	Ins.
Prison Observatory Penang ...	29·883	149	84·7	87·6	75·8	11·8	77·6	·907	73	827	S.E.	5·89	2.11

Prison Hospital.
Penang, 15th October, 1910.

E. Arthur Gimlette,
Medical Officer.

NEGRI SEMBILAN.

Abstract of Meteorological Readings in Negri Sembilan Hospitals for the month of September, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Seremban		148.9	82.3	87.2	72	15.1	76.5	812	72.9	73.6	W	7.84	2.20
Mantin												5.67	1.39
Tampin												4.11	1.15
Kuala Pilah												4.14	.97
Jelebu												4.31	1.11
Port Dickson Town												8.11	1.72
Do. Blri Beri												9.56	1.51

Office, of the Medical Officer in Charge.
Seremban *22nd October, 1910.*

A. J. M. CLOVELY.
Medical Officer in Charge.

SELANGOR.

Abstract of Meteorological Readings in the various Districts of the State for the month of September, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
General Hospital, Kuala Lumpur ...	28.856	146.6	81.5	88.7	73.2	15.5	76.2	.802	72.6	75	CALM	4.97	1.45
Pudoh Gaol „ ...	...	...	...	...	...	...	...	...	...	...	...	4.94	1.36
District Hospital „ ...	...	...	...	...	...	...	...	...	...	...	...	5.40	2.32
„ Klang... ...	...	...	...	91.0	69.8	21.2	...	...	...	...	...	5.38	2.88
„ Kuala Langat ...	...	...	...	88.8	73.0	15.0	...	...	...	...	...	6.18	1.98
„ Kajang ...	...	...	...	85.6	75.3	10.3	...	...	...	...	...	8.56	2.41
„ Kuala Selangor ...	...	...	...	88.1	75.6	12.5	...	...	...	...	...	5.95	1.70
„ Kuala Kubu	...	...	...	91.1	70.4	20.7	...	...	...	...	...	11.82	4.74
„ Serendah	...	...	...	92.2	70.5	21.7	...	...	...	...	...	5.13	2.19
„ Rawang	...	...	...	90.9	71.3	19.6	...	...	...	...	...	6.85	3.03
„ Sabak Bernam ...	...	...	...	...	...	...	...	...	...	...	...	3.53	1.01

Office of Senior Medical Officer,
Kuala Lumpur, 20th October, 1910.

Senior Medical Officer, Selangor.

PERAK.

Abstract of Meteorological Readings in Perak for the month of September, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taiping	...	109	82.57	93	70	23	77.41	872	...	79	...	3.96	1.26
Kuala Kangsar	...	...	81.61	92	67	25	75.95	820	...	76	...	4.08	1.71
Batu Gajah	...	110	80.78	91	72	19	76.42	853	...	82	...	3.03	1.32
Gopeng	...	...	80.65	91	69	22	75.09	797	...	76	...	5.94	1.87
Ipoh	...	...	80.90	91	70	21	75.98	833	...	78	...	8.68	3.35
Kampar	...	...	80.61	92	69	23	75.98	838	...	80	...	6.22	1.86
Teluk Anson	...	...	81.95	91	69	22	77.07	866	...	81	...	3.43	1.32
Tapah	...	...	81.17	92	69	23	76.36	847	...	80	...	10.00	2.10
Parit Buntar	...	...	81.66	90	72	18	76.61	849	...	78	...	5.14	.95
Bagan Serai	...	...	81.71	91	70	21	76.73	858	...	78	...	5.15	2.05
Selama	...	...	80.60	92	71	21	76.14	841	...	80	...	8.06	2.00

Office of Senior Medical Officer,
Ipoh, October 14th, 1910.

S. Lucy,
Senior Medical Officer, Perak.

PAHANG.

Abstract of Meteorological Readings in the various Districts of the State for the month of August, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Mean Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
										%			
Kuala Lipis	...	...	75.7	91	65	20.9	74.0	.897	72.80	91	...	12.62	2.05
Raub	...	...	80.6	93	66	23.2	77.81	.057	75.90	86	...	6.49	1.50
Bukit Fraser	...	...	...	...	58	...	...	...	...	...	...	6.06	1.23
Bentong	...	...	80.2	92	67	19.4	75.91	.023	72.98	80	...	5.58	1.72
Temerloh	...	...	...	94	69	19.9	...	...	...	...	...	4.11	1.28
Pekan	..	...	82	91	70	16.7	77.1	.092	73.65	78	...	4.15	1.20
Kuantan	...	...	85	94	69	19	78.11	.203	73.62	71	...	4.06	1.11
Sungei Lembing	...	...	...	87	68	...	...	...	...	...	...	7.37	1.42

OFFICE OF THE MEDICAL OFFICER IN CHARGE, PAHANG
K. Lipis, 21st September, 1910.

S. C. G, FOX,
Medical Officer in Charge, Pahang.

SEREMBAN.

Table showing the Daily Results of the ading of Meteorological Observation taken at the General Hospital, Seremban, for the month of September, 1910.

Date.	Temperature of Radiation.						Temp. of Radiation.		Wind Direction.		Temp. of Evaporation.			Computed Vapour Tension			Relative Humidity.			Clouds 0 to 10			Cloud and Weather Initials.			Rain.
	9 H.	15 H.	Mean.	Maximum.	Minimum.	Range.	Sun.	Difference Sun & Shade.	9 H.	15 H.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H.	21 H	9 H.	15 H.	21 H	Inches.
1	84	86	85.	88	72	16	155	67	S W	S W	69.1	72.8	70.9	.710	.808	.759	60	64	62	0	0	0	S	S	S	.26
2	78	85	81.5	87	71	16	147	60	S E	W	71.2	73.4	72.3	.765	.826	.795	79	68	73.5	1	0	0	S	S	S	1.25
3	80	87	83.6	88	71	17	156	68	W	W	73.3	73.9	73.6	.820	.837	.828	80	65	72.5	0	0	0	S	S	S	
4	79	82	80.5	88	72	16	160	72	W	W	72.3	75.3	73.8	.793	.877	.835	80	80	80	0	10	4	S	N	C	1.10
5	78	83	80.5	86	73	13	149	63	W	S W	76.3	76.3	76.3	.906	.905	.905	94	80	87	5	0	0	C	S	S	.10
6	80	84	82.	85	72	13	138	53	W	N W	75.	75.7	75.3	.867	.888	.877	85	76	80.5	0	0	0	S	S	S	.34
7	81	84	82.5	87	73	14	152	65	W	S W	72.6	72.4	72.5	.802	.794	.798	76	68	72	0	5	7	S	C	N	.91
8	77	85	81.	86	72	14	153	67	W	W	73.6	71.8	72.7	.829	.781	.805	89	64	76.5	4	0	0	C	S	S	.04
9	82	88	85.	89	72	17	148	59	W	S W	73.6	71.6	72.6	.830	.775	.802	76	58	67	0	0	0	S	S	S	.10
10	77	87	82.	88	73	15	150	62	W	S W	73.6	73.9	73.7	.829	.837	.833	89	65	77	5	0	0	C	S	S	
11	82	85	83.5	87	73	14	145	58	W	W	73.6	73.4	73.5	.830	.826	.828	76	68	72	0	0	0	S	S	S	
12	79	86	82.5	87	73	14	156	69	W	S W	73.9	71.2	72.5	.839	.763	.801	85	61	73	5	0	0	C	S	S	
13	81	89	85.	90	72	18	154	64	W	S W	74.3	72.7	73.5	.849	.801	.825	80	58	69	0	0	0	S	S	S	
14	81	82	81.5	89	70	19	153	64	N	S W	70.9	75.3	73.1	.757	.877	.817	72	80	76	0	4	6	S	C	C	
15	78	83	80.5	84	73	11	143	57	N	N W	71.2	71.3	71.2	.765	.766	.765	79	68	73.5	5	4	0	C	C	S	
16	80	85	82.5	86	73	13	135	49	N	N	69.9	71.8	70.8	.732	.781	.756	71	64	67.5	0	0	0	S	S	S	
17	78	84	81.	85	74	11	136	51	W	N W	71.2	74.	72.6	.765	.840	.802	79	72	75.5	6	0	0	C	S	S	
18	79	85	81.	87	72	15	142	55	N W	N W	72.3	73.	72.6	.793	.810	.801	80	72	76	0	7	0	S	N	S	.42
19	82	90	86.	91	73	18	156	59	W	S W	75.3	73.7	74.5	.877	.833	.855	80	59	69.5	0	0	10	S	S	N	2.20
20	76	85	80.5	87	71	16	152	65	N	S W	72.6	73.4	73.	.801	.826	.813	89	68	78.5	10	8	0	S	N	S	
21	81	80	80.5	86	71	15	155	69	N W	S W	72.6	73.3	72.9	.802	.820	.811	76	80	78	0	0	0	S	S	S	
22	79	84	81.5	86	71	15	145	59	N	W	72.3	74.	73.1	.793	.840	.816	80	72	76	0	0	0	S	S	S	.84
23	78	85	81.5	86	72	14	150	64	N W	S W	72.9	73.4	73.1	.810	.826	.818	84	68	76	0	0	0	S	S	S	
24	80	86	83.	88	71	17	158	70	W	S W	73.3	74.5	73.9	.820	.855	.837	80	68	74	0	0	0	S	S	S	.22
25	76	85	81.5	86	71	15	153	67	W	W	72.6	73.4	73.	.801	.826	.813	89	68	78.5	5	0	0	S	S	S	
26	80	86	83.	88	73	15	151	63	W	S W	73.3	74.5	73.9	.820	.855	.837	80	68	74	0	0	0	S	S	S	
27	78	86	82.5	87	73	14	148	61	W	S W	73.9	72.8	73.3	.839	.808	.823	85	64	74.5	0	0	0	S	S	S	
28	79	86	82.5	88	71	16	144	56	N W	S W	70.6	69.5	70.	.749	.721	.735	75	58	66.5	0	0	0	S	S	S	
29	82	85	83.5	87	70	17	132	45	N W	S W	72.	70.1	71.	.785	.728	.766	72	61	66.5	0	0	0	S	S	S	
30	80	87	83.5	89	72	17	156	67	W	S W	71.6	72.2	71.9	.775	.792	.783	75	61	68	0	0	0	S	S	S	
31																										
Mean.	79.5	85.1	82.3	87.2	72	15.1	148.9	61.2	W	S W	72.6	73.1	72.9	.811	.817	.812	79.8	67.5	73.6							7.84

Seremban,
22nd October, 1910.

Highest Temperature 91
Lowest Temperature 70

Greatest Rainfall in 24 hours 2.20

A. J. M. CLOVELY,
Senior Medical Officer in Charge.

No. 12.] DECEMBER, 1910. Vol. IX.

Agricultural Bulletin

OF THE

STRAITS

AND

FEDERATED MALAY STATES.

EDITED BY

H. N. RIDLEY, M.A., F.R.S., F.L.S., F.R.H.S.

Director of Botanic Gardens, S.S.

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AGRICULTURAL BULLETIN

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No. 12.] DECEMBER, 1910. [Vol. IX

A PRELIMINARY NOTE ON THE FUNGUS CAUSING THE "DIE-BACK" DISEASE OF CACAO AND OF PARA RUBBER.

By Keith Bancroft, B. A.

Assistant Mycologisl, F.M.S.

In some recent publications* the author has had occasion to refer to the necessity for making a complete investigation of the life-history of *Diplodia cacaoicola*, P. Henn., the fungus which has long been known to cause the "die-back" disease of the stem of the cacao plant and the "brown rot" of the cacao pods. Since these publications were issued, further work has revealed two facts which are considered to be of some importance; the first of these is the establishment of the identity between the fungi causing the "die back" of cacao and of Para rubber, and the second is the discovery of the mature form or ascigerous condition of the fungus. Before describing the work which has led to these conclusions it will, perhaps, be better to briefly summarise the work of several authors on the fungus more especially from a historical point of view.

Diplodia cacaoicola was described by Hennings on wood of cacao from the Cameroons in 1896. Howard, in 1901, investigated a die-back disease of cacao in Grenada, West Indies, and showed that the fungus which caused the disease was identical with this species. Since then the fungus has been shown to occur on cacao throughout the West Indian Islands and has also been reported from St. Thomè, West Africa, Java, Samoa, the Philippines and Surinam.

* Kew Bulletin of Miscellaneous Information, 1910, No. 3. A Handbook of the Fungus Diseases of West Indian Plants, p. 11.

Griffon and Maublanc, in 1909, working in the French Congo, have shown by comparison of various specimens that three other species are identical with *Diplodia cacaoicola*: these are *Botryodiplodia Theobromae*, Patouillard, 1892, the oldest synonym, described on fruits of cacao in San Domingo, *Lasiodiplodia nigra*,, Appel and Lambert on cacao in Samoa, and *Macrophoma vestita*,, Prilleux and Delacroix, 1894, on roots of cacao in equatorial America; these authors have also shown that according to the present system of classification the fungus is a *Lasiodiplodia* which they have named *Lasiodiplodia Theobromae*. More recently Petch has described from Ceylon a "die-back" disease of *Hevea brasiliensis*, the later stage of which he has attributed to *Botryodiplodia elasticae*, Petch; he has pointed out that this species is probably identical with *Diplodia cacaoicola* (*Lasiodiplodia Theobromae*, Griffon and Maublanc). There has, therefore, been from time to time a multiplication of names for one and the same fungus.

A careful comparison of the fungus causing the "die-back" disease, or what is better known as the "stem and branch" disease of *Hevea brasiliensis* in the Straits Settlements and Malay States with the fungus occurring on cacao in West Africa has quite recently been made at the Department of Agriculture at Kuala Lumpur. After an examination of several specimens it has been concluded that the two fungi are identical. The characters which were considered were the nature of the stroma and perithecia, the measurement of the perithecia, of size and shape of the spores and he the paraphyses; in these the two fungi were indistinguishable from each other

The cause of the occurrence of these synonyms is the absence of a constancy or fixation of characters on which the divisions between the genera are based. In *Diplodia* the perithecia are scattered, in *Botryodiplodia* they are aggregated on a stroma which is smooth and in *Lasiodiplodia* they are included in a stroma which is covered with a soft felt of hairs. In the fungus under consideration there is a tendency for the perithecia to be scattered on the younger parts of the stem, while on the older parts they are usually aggregated on a stroma: the stroma is in some cases almost smooth, while in others, and especially when the fungus is producing perithecia in large numbers, the stromata are covered by a soft felt of hairs. The perithecia always contain paraphyses mixed with the spore-bearing hyphae.

This variability in characters has led to the multiplication of names for the fungus and has tended to prevent the recognition of its wide geographical distribution and of its variety of hosts.

In a previous work* the author was careful to point out that judging from analogy the *Diplodia* on cacao might well be expected to belong to an ascigerous fungus which was probably a member of the *Sphaeriaceae*. To investigate this point a number of cultures were made in artificial media; several of these are now more

* A Handbook of Fungus Diseases of West Indian Plants, p 11,

than a year old and these have failed to show the production of any form other than the *Diplodia*. Eight months ago some material was received from West Africa at the Jodrell Laboratory, Kew Gardens; this material consisted of a stem of the cacao plant which had been badly attacked by *Diplodia* and on which the fungus was producing abundant perithecia grouped in stromata. Some of this material was selectd and placed in a sealed jar. An examination at the end of six months showed that the fungus was passing into an ascigerous condition. The formation of the asci in the same stromata as had previously borne spores of *Diplodia*, coupled with the fact that asci could be observed in process of formation in some of the perithecia on a stroma while other perithecia on the same stroma had not yet got rid of all of their *Diplodia* spores, left no room for doubt that it was the ascigerous condition of the fungus.

From the mode of arrangement of the perithecia and from the nature of the stroma, asci and spores, the fungus has been classified in the genus *Thyridaria*, Saccardo (Sphaeriaceae, Phaeophragmiae) and has been named *Thyridaria tarda*, n. sp. The following diagnosis of the fungus is here given:—Peritheciis monostichis, stromate atro erumpente villosulo semi-immersis (3-7), ostiolo minuto; asci cylindraceo-clavatis sessilibus, 90-100x 12 microns, paraphysibus (100-130 microns longis) copiosis filiformibus obvallatis; sporidiis oblique monostichis, oblongatis, fuligineis, triseptatis, leniter constrictis, 19-20 x 6-7 microns.

Diplodia (*Lasiodiplodia*) pycnidicus status est:—Sporis ellipticis, utrinque obtusis, uniseptatis, haud constrictis, fuligineis 24-27 x 13-15 microns.

(*Translated*). Perithecia monostichous, semi immersed (3-7) in a black erumpent stroma bearing a covering of weak hairs, having a minute ostiole, asci cylindrical-clavate, sessile, 90-100 x 12 microns surrounded by abundant filiform paraphyses (100-130 microns long); spores obliquely monostichous, oblong, fuliginous, 3-septate, slightly constricted at the septa, 19-20 x 6-7 microns,

Diplodia (*Lasiodiplodia*), is the pycnidial form:—Spores elliptical obtuse at both ends, uniseptate not constricted, fuliginous, 24-27 x 13-15 microns.

The *Diplodia* form is esentially the form which is destined for rapid reproduction of the fungus. It does not appear to pass readily into the ascigerous condition, as is evidenced by the failure hitherto to reproduced the ascigerous condition in artificial media. This is, however, not infrequently met with in the conidial and pycnidial forms of ascigerous fungi in the tropics.

The life-history is, however, not yet complete; it is still necessary to trace the development of the ascospore. This work is being continued and will be published when it is completed along with an account of the disease more especially as affecting the Para rubber plant.

At present the following facts may be considered to be established :—

(1). *Thyridaria tarda* is the cause of the "die-back" disease of the cacao plant and of the "brown rot" of cacao pods. Its *Diplodia* form is identical with the *Diplodia* which is known to cause a "die-back" disease of Para rubber in the Straits Settlements and Federated Malay States. The fungus also attacks mango, papaw, *Castilloa*, rubber, sugarcane and *Albizzia moluccana*, and is considered to cause a root disease of coconut in Trinidad.

(2). It occurs in the West Indies, tropical America, tropical Africa, the Philippines, Ceylon (?), Java, Samoa, St. Thomè and the Malay Peninsula.

(3). It is a wound parasite, and the disease is caused by the fungus when it is in its *Diplodia* stage. The *Diplodia* condition is capable of reproducing itself and passes on the dead parts into the ascigerous (*Thyridaria*) condition some time after they are dead.

The following references are appended :—

1892. PATOUILLARD.—Bulletin de la Societé mycologique de France, p. 136.

1894. PRILLEUX & DELACROIX.—Bulletin de la Societé mycologique de France, p. 165, t.vi, fig c.

1896. HENNINGS.—Fungi Camerunenses; Engler Bot. Jahrb., xxii, p. 172.

1901. HOWARD.—West India Bulletin, Vol. II, p. 203.

1906. APPEL & LAUBERT.—Arb. aus der Kaiserl. Biol. Anst, fur Land and Fortswirts, p. 147. 1906.

1909. GRIFFON & MAUBLANC.—Bulletin de la Societè Mycologique de France, xxv, p. 51.

1910. PETCH.—Circulars and Agricultural Journal, Royal Botanic Gardens, Ceylon, iv, No. 23.

A BACTERIAL DISEASE OF POTATO AND TOMATO.

BY KEITH BANCROFT, B.A.

Assistant Mycologist, F. M. S.

Specimens of potato plants have been recently received from Taiping (Perak) exhibiting the well-known "bacteriosis" caused by *Bacillus Solanacearum*, E. Smith. The same disease has been known for two or three years to occur in Kuala Lumpur on tomato plants cultivated in vegetable gardens. These two crops are but little cultivated in the

Malay States, so that the disease has little more than a passing interest. It is, however, interesting to record its occurrence in this country, and a brief note will be given of the symptoms of the disease and of some methods of treatment which are likely to prove effective.

The disease is well-known in the United States of America where it has been carefully studied by Dr. E. Smith on potato, tomato and egg-plant (*Solanum melongena*). It has also been recorded on potato in Scotland, in the north of England and in Mysore, and it has recently been reported from Ceylon.

The symptoms of the disease appear to be constant in the different countries in which it is known to occur, and they may be briefly reviewed thus:—

Attacked plants show a wilting and shrivelling of the leaves; soon afterwards brown streaks appear on the stem and spread downwards to the parts underground. Finally, the whole stem rots. A browning of the affected parts is very characteristic of the presence of the bacterium; the browning will be found to be first evident in the vascular ring on examining the cut surface of an affected stem. The vascular bundles are first affected, the supply of water to the leaves is checked and the consequent wilting and shrivelling makes its appearance.

The disease in the potato tubers is very well-marked by the presence of a circular, usually incomplete, brown ring which is situated at some litttle distance from the surface and which corresponds in position with the vascular ring of the tuber. This ring darkens and expands until the whole of the starch-producing area of the tuber is affected. The tuber decays and the bacteria are liberated in the soil where they can infect other healthy tubers.

Dr. E. Smith considers that the rapid spread of an epidemic is due to insects of different kinds feeding alternately on healthy and infected plants. Under these circumstances it is advisable to spray the plants with an insecticide. A vegetal wash, e.g tobacco wash, should yield good results. This may be made by infusing half a pound of tobacco leaf in water for about six hours, straining off and pressing the tobacco and again infusing; the extract is added to a solution of half a pound of soft soap in water, the whole being made up to ten gallons. The wash is applied by means of a spray. Any coarse tobacco leaf may be used.

Infected plants should be taken up along with their roots and burnt. They must on no account be thrown on to a manure heap. In the case of the potato plant it is advantageous to lift the crop early when the disease has made its appearance; in this way many of the tubers may be saved.

Plants belonging to the potato family should not be planted on soil which has yielded infected plants for at least two years, since the bacterium probably attacks a large number of members of that family (*Solanaceae*).

E. F. SMITH.—United States Department of Agriculture, Bull. No. 12, 1896.

G. MASSEE.—Diseases of Cultivated Plants and Trees, p. 513, 1910.

T. PETCH.—Tropical Agriculturist, Vol. xxxiii, No. 6, Dec. 1909.

A HANDBOOK OF FUNGUS DISEASE OF WEST INDIAN PLANTS.

We have received an excellent little handbook dealing with the parasitic fungi of the West Indies by Mr. Bancroft which is most compact and handy. Many of the fungi described and figured are well-known pests here, such as *Fomes semitostus, Irpex flavus, and Diplodia* and there are accounts of the best methods of dealing with these pests. It is interesting to find *Schizophyllum commune* recorded as a parasite on sugar cane and mulberry trees. This little grey fan-shaped fungus is familiar to us here as being one of the commonest destroyers timber in buildings and wood-yard. I have never yet, common as it is, seen it attacking any live plant. It is much to be hoped that similar works will be published on our pestilential fungi here. The only large work on parasitic fungi is that of Tubeuf, an invaluable work but unfortunately for us almost confined to the fungi of temperate climates. A good work on the parasitic fungi of the tropics is badly wanted. Much has been written about them but it is scattered over various periodicals and practically inaccessible to the ordinary searcher after knowledge.—ED.

PLANTING OF TREES.

A tree planted anyhow does not grow as satisfactorily as one properly planted, and the usual coolie method of just making a hole and putting the plant in, giving it a little water and leaving it to live or die as it chooses, generally has poor results. One of the commonest blunders here is caused by not filling up the hole properly. A hole is dug, the soil more or less mixed with leaf mould and cowdung, filled to the top or nearly so and the plant put in. The result is that the loose soil sinks to several inches below the surface of the surrounding ground, and the plant appears in a small pit. Into this rain water pours and the plant's roots are sodden and the unhappy thing dies or at least has a hard struggle for life. The soil should be raised to at least six inches above the surrounding ground so that the plant is at first on a mound which sinks as the earth settles, so as to bring the plant in a few days into its proper position. I have often seen rubber trees planted in pits in the regular coolie method much to their detriment. Another thing is of importance and that is to press the earth tight round the tree after planting it. Some time ago, in Bulletin 8., 1909, p. 239, we published an account of tree planting from experiments made by Mr. Pickering, of the Woburn Experimental Fruit Farm. Similar experiments have been carried out in the West Indies with oranges, mangoes, limes, and rubber, castilloa, and an account has been published in the West Indian Bulletin vol. xi p. 50, with photographs of trees planted (a) in the ordinary way carefully; (b) carefully planted and rammed with a heavy rammer till the whole was thoroughly puddled and the ground shook like a jelly; (c) carelessly planted, roots heavily pruned and rammed; (d) carelessly planted, roots heavily pruned and not rammed; (e) carelessly planted and rammed. The results seemed to show that the trees carefully planted and not rammed were the best, and next came those under treatment, (b). Carelessly-planted trees in no case seem to do well.

Probably the amount of ramming desirable depends on the kind of soil in which the plant is growing. It is a fact that a number of our fruit trees, such as Rambutans, are killed by putting a few feet of soil over the roots. Thus, in cases where low-lying ground bearing an orchard is filled in for say two feet with the ordinary clay soil, a large percentage of the trees will quickly die. This may be due to the heavier weights on the roots, or their being more compressed, and it is possible that this heavy ramming may have the same effect. The experiments would be well worth trying with rubber trees here. They show at least that careful-planting pays.—Ed.

THE STERILIZATION OF SOIL AS A MEANS TO INCREASE ITS FERTILITY.

The ultimate cause or causes of soil fertility have from the earliest ages remained obscure and when one realizes that the practice or art of Agriculture is the oldest in the world, this obscurity is perhaps somewhat remarkable to the lay mind, although not to the scientific investigator who has tried and is still trying to evolve theories and explain facts from the vast amount of experience in the past from which he is able to draw.

As soon, however, as one begins seriously to consider the subject, its immensity is apparent and it is realized how many are the factors which influence what we describe as soil fertility.

The facts are, however, sufficiently realized by the practical man whether planter or farmer who is ready to pay two or three times the amount for a certain piece of land compared with another.

The science of Agriculture dates back to the seventeenth century but the work done by numerous investigators in the early years bore little fruit, due principally to the fact that the science of chemistry had scarcely been born, and it was not till the nineteenth century when the nature of the elements and their combinations began to be known that agricultural chemistry as a science was really founded.

It was not till nearly the middle of the nineteenth century that it was understood that the plant derived its nutrition partly from the air and partly from the soil, and the first theory which was in any way supported by facts that soil fertility was based on the amount of the material required by the crop and capable of being removed from the soil.

It was soon realized, however, that there was a vast difference between the amount of material taken out by a crop and the total material present in the soil, and that this theory did not by any means explain the facts, since any normal soil contains sufficient material, e. g., potash, phosphoric acid, calcium, etc., for say a hundred crops,—and yet a very small quantity of a suitable manure gave remarkable increases of crop.

This naturally led up to another theory—that of "unavailable" and "available" plant food,—the latter being in some way only slowly formed in soils—the addition of a manure would thus really mean the addition of available food.

This theory was forgotten and renewed again within quite recent years and in fact one of the recognised methods of soil analysis of the present day is to determine what is known as "available" potash, and phosphoric acid.

Even this theory is, however, now abandoned by various well-known investigators who believe that the actual amount of plant food in the soil has little if any influence on soil fertility,—but, on the other hand, there are many equally brilliant investigators who think that the abandonment of this theory is not logical. One has particularly to bear in mind in studying such a complex material as the soil and its fertility—the question of limiting factors, i. e., if one particular ingredient is entirely absent, the plant starves, however liberally it may be supplied with the others.

A more recent theory expounded by several investigators, particularly in America, and receiving support from others in various parts of the world, is that fertility is determined by plant excretions, that is, that plants excrete a poison which is injurious to themselves—hence the necessity of crop rotation.

One investigator in fact claims to have actually isolated compounds from such soils, injurious to the same crops which produce them, but the results are far from conclusive.

Having failed to account for soil fertility by the amounts of plant food actually found in various soils by analysis, we are compelled to search for other causes, and although we have again to return to older theories—as has frequently happened in the advance of science in general, it was not till comparatively recently that such theories—then only advanced as theories—have been found to explain certain facts.

Recent investigations have shown the presence in soils of bacteria now known as "nitrifying bacteria" which convert nitrogenous matter into nitrites and subsequently nitrates by oxidation—and thus supply plants with nitrogen in an assimilable form—since with the exception of a few plants, viz., those of the leguminous order—plants can only assimilate nitrogen after conversion to an oxidized form. Such bacteria are consequently regarded as a great factor in soil fertility.

The proof of the existence of such oxidizing bacteria explained to a great extent the value of tilth in surface soil, the lack of value of the subsoil in which such bacteria do not exist, and the value of shallow ploughing contrasted with deep subsoil ploughing.

These discoveries led to others, in which two brilliant investigators, Hellreigel and Wilgarth and subsequently others made the interesting discovery that certain plants of the leguminous order possessed bacteria growing in symbiosis on the roots, which possessed the power of assimilating nitrogen directly from the atmosphere and converting it into a form suitable for the use of the plant.

Long before this discovery, however, the value of leguminous plants had been realized by the farmer and a system of rotation of crops based on it. Since the discovery, other bacteria possessing similar properties, but not associated with any plant, have been found in the soil.

The farmer long before this, also, had realized the value of what is known as "fallowing," in which sufficient food is allowed to accumulate for a period, to supply the bacterium with its food.

From the fact, however, that these discoveries do not absolutely explain or account for all the problems of soil fertility or lack of fertility, we realize that these bacteria are merely another determining factor in connection with the problem.

These results have remained without intrinsic alteration till quite recently, when we are brought in contact with another phase of the question. the elucidation of which has been solved by Russell and Hutchinson within the last year, viz., the partial sterilization of soil as a means to increase its fertility.

Here again we have the accumulated experience of ages of agricultural practice explained by the results of scientific investigation.

The effect of heat on soils has been known not only in European agricultural practice but in other countries—notably India and I find too that it is known to Javanese gardeners in this country, whose common practice is to burn together a mixture of earth and dry manure before using it in pots for horticultural purposes. When asked why they practice this method—they reply that it is valuable' although they offer no reason why this is so.

It is now known that partial sterilization of soils, not only by heat, but by certain antiseptics such as chloroform and carbon bisulphide, has a very beneficial action, and the reason for this action has been most ably explained by the above mentioned investigators.

Crops grown on soils sterilized by heat become doubled in some cases, and almost equally good results are obtained by treating with antiseptics. The plants on analysis are also found to contain much more nitrogen than those from undertreated soils, showing that the result of the treatment has effected an increase of nutriment.

Russell and Hutchinson found that (1) the nitrogen combined as ammonia in the soil increased remarkably under the treatment (2) the treatment did not effect complete sterilization (3) the bacteria in the soil were greatly reduced in number at first (4) subsequently the bacteria increased to an enormous extent, and far beyond the original number, (5) the nitrifying bacteria were destroyed.

From these results they naturally concluded that the increased ammonia content of soil treated in this manner was due to the increase in bacteria, and the absence of nitrifying bacteria which enabled the ammonia to accumulate; but the real value and brilliancy of their discoveries was the realization that the subsequent enormous increase of the bacteria was due to the absence of some factor in the soil which had been destroyed in the process of partial sterilization.

Subsequent investigation proved that this factor was a class of larger organisms—amoeba or protozoa which under ordinary conditions fed on the bacteria and maintained them at a normal number, and that these organisms were completely destroyed by the sterilization process, thus allowing the bacteria to multiply at an extraordinary rate.

These results have since been confirmed by others and by evidence of a different nature, and also by the practice of the agriculturist in ancient days and in other lands than in Europe.

Science has once more explained facts known long years ago, and will doubtless be able to demonstrate in what way such facts may be utilized again to the best advantage in advancing the ancient art and practice of agriculture.

Already in fact on a small scale, a method has been adopted, based on these principles, for the sterilization of soils for nursery beds and for intensive cultivation of vegetables and market produce, and it might be of interest and value to give details of this method for the benefit of those who may be interested in the subject.

The method is described in Vol. VIII, Part 6, of the Journal of Agriculture of Victoria, for June, 1910.

In this article the writer incidentally mentions the discovery of the action of heat on soils some 25 years ago and the action of carbon bisulphide, the effect of which was first observed when applied in certain vineyards for the purpose of eradicating phylloxera.

The various theories to account for these effects are those numerated as follows:—

(1). Chemical reaction formed by heat or between antiseptic and soils—recently revived by Pickering in England.

(2). Physiological theory of Koch—the antiseptics being supposed to stimulate root activity—since disproved by Russell's and Darbishire's experiments—in which all the antiseptic was evaporated from the soil after treatment.

(3). Change of bacterial flora as suggested by Hiltner and Storme

(4). Stoklasa's theory—that the production of too much carbon dioxide by bacterial interferes with the plant's respiration does not hold good in the light of Russell's and Hutchinson's recent investigations.

(5). Russell's and Hutchinson's theory—increase of bacteria after primary decrease, due to destruction of large organisms of protozoal nature.

Soils sterilizer :

A very effective sterilizer is described as follows :—

A brick chamber 18 inches deep consisting of brick floor with brick walls 9 inches thick, the chamber is open at the top and divided into two compartments by a brick partition, each compartment having a capacity of two tons. Only one compartment is used at a time, so that the other can be filled while the first is being sterilized.

Steam is supplied from a portable boiler worked at a pressure of 25=30 lbs., the steam being led to the floor of the chamber through ¾ in. piping. The tube is here joined to a T piece and from the T piece in each of the pits, six pipes are let into a space between the bricks work on the floor. The pipes between the brick work and the floor are covered over with a layer of sand ; they are 8 inches apart, plugged at the ends and perforated along one side with 3/16 inch holes—about 3 inches apart, and have a fall of 1 inch. A side drain is provided at one side of the chamber to carry off condensed steam this drain is buried in cinders 1 inch below the surface and has a fall of 2=3 inches.

Steam can be turned into either compartment by means of valve traps as desired. The soil is placed in the chambers and covered, with sacking and steam allowed to pass through the mass till the temperature of the top layer is 212°F (i. e., boiling point of water). It is then allowed to steam for 30 minutes—making a total period of about 2½ hours.

As soon as the soil is sufficiently cool, it can be used for seed beds. It can be readily seen, that apart from initial expense which is not high, the apparatus is simple, effective and economical and should be of immense value in preparing good soil for seed beds of all kinds.

The cost of sterilizing 1,000 cubic feet of soil by this method is stated to be only about 8 shillings. The treatment not only improves the soil but kills all larger forms of life present in the soil likely to be injurious to plant life.

B. J. Eaton,
Agricultural Chemist, F. M. S.
and
Acting Director of Agriculture, F. M. S.

THE CONTROL OF SCALE INSECTS BY FUNGOID PARASITES.

For some years experiments have been carried out chiefly in the West Indies and Florida, on the destruction of scale insects by infecting them with certain fungi parasitic on them.

That these fungi gave a very severe check to the scale insects in a natural state was shown by an observation on orange scales

infesting orange trees in Florida. The trees bore very few scale insects, till they were thoroughly sprayed with Bordeaux mixture when they immediately began to increase owing to the parasitic fungi being destroyed by the Bordeaux mixture and the trees were finally badly attacked. Similar trees near by which were not sprayed were as free from scale as before. The principle of infecting the trees infested by scale with the suitable fungi has been found successful in combating the pests, and three methods of so doing have been adopted. The first is to spray the infected trees with spores and portions of mycelium of the fungus. This is done by stirring up leaves well infected by the fungus for ten to fifteen minutes in water, so that about forty fructifications are mixed with a pint of water. The liquid is then strained through a fine wire mesh or coarse muslin, and sprayed on the trees, as finely as possible. This has been found the most effective way.

The second method is to tie infected material in the trees so that the spores of the fungus may come in contact with the scales. This has proved very successful also. The third method consists of planting among the trees to be infected small trees bearing the parasitic fungi so that the spores may spread from one to the other.

The Coccidae are not as a rule so destructive in the Malay Peninsula as they are elsewhere, but occasionally are very abundant and injurious. No attempt has been made yet in this region to study their parasitic fungi, but we may hope that our mycologists will devote some time to this subject, in order that in case of attacks we may be able to deal with them. The greatest attention seems to have been paid to the scale attacking limes and oranges in the West Indies and Florida, and these plants are worse attacked her ethan any other.

The whole paper from which these notes are taken (published in the West Indian Bulletin Vol by i. p. by Mr. F. W. South) is one of considerable interest and well worth study.—Ed.

COTTON IN GERMAN EAST AFRICA.

We have received from the Kolonial Wortschaftliches Komitee of Berlin an excellent account of the cultivation of cotton in the German Colonies (Anleitung fur die Baumwolkultur in den Deutschen Kolonien) by Prof, Dr. A. Zimmermann. The work, though not a very large one, is very rich in important information and is very well illustrated and treats in a compact way of the varieties, cultivation, preparation, returns, markets, value and use of the seed, and the diseases. Of animal pests the author records 258 kinds ranging from the hippopotamus to coccids and eelworms. The number of Hemiptera as pests is very large. Upwards of eighty fungi are

recorded as attacking the cotton plants. The pests recorded are however records of enemies all over the world and a very large proportion are naturally not met with in the German colonies. The literature of cotton is very large but this little work of 145 pages is a useful addition.

In their African Colonies the Germans have a fine field for the extension of one of the most important products of the world, and they seem to be making great progress in the cultivation of cotton.—ED.

PURIFICATION OF BRACKISH WATER ON ESTATES.

M. Kelway Bamber sends us the following letter on the treatment of brackish water from the saline muds and peaty soils, which not rarely occur on our lowland country near the sea. This article will, we think, be read with interest by those who have estates on the plain country along the coasts where the water is often foul.

"Re brackish water from Selangor muds, I had some sent over of the worst kind to make some experiments regarding its purification for drinking and manufacturing purposes. I enclose the analysis. The water was sour, brackish, muddy, and with a strong smell of decomposing organic and sulphur compounds.

Lime water produced an immediate curdy precipitate which settled clear in a few minutes, but the water still had some smell.

Alum solution caused a similar precipitate even more rapidly and the water cleared at lonce, but the smell was intensified and the water was still very acid.

Permanganate of Potash also caused a bulky precipitate and if sufficient was added the smell in 24 hours practically disappeared, but this alone would be too expensive.

I then found that a mixture of lime water, Alum and Permanganate of Potash, gave a clear water with little or no smell and quite capable of being used for rubber manufacture or for drinking, the cost being only about 23 cents per 1000 gallons.

The method to adopt should be to dig settling tanks in one of the main drains passing near the factory site. These should be about 50′ long and 14′ wide by 6′ deep and can be dug along the drain at intervals of 50′ or so. Two thirds full they would each hold 17,500 gallons and they would require

12 lbs. Quicklime stirred up in cold water
34 lbs. Alum.
½ lb. Permanganate of Potash.

The cost of these would be about 4s. 2d. or say $4 on the estate.

There should be wooden doors across the drain above and below the first and last settling tank, which could be closed if necessary after rain to keep the tanks full.

The lime water should then be sprayed over the tank, followed by the alum solution, the water being stirred to cause even admixture.

Finally the permanganate solution can be sprayed on as uniformly as possible after the bulk of the precipitate has settled.

If the pink colour produced by the last salt disappears rapidly, more permanganate should be added until the water remains pink for at least half an hour.

The water will then settle clear and practically free from odour and can be pumped to the factory from the nearest tank.

The drain between the settling tanks can be the same depth as the tanks so that all the water can be uniformly treated.

Similar tanks can be dug in other drains about the estate to provide clear water for tapping and washing purposes.

For drinking purposes the water can be boiled in addition, but if the right amount of permanganate is added it is not absolutely necessary.

The quantity of Lime added should be sufficient to neutralise the acidity and can be increased with impunity as a hard water will probably be found to give better results in the factory.

I thought perhaps you would like to publish this regarding brackish water for the benefit of estates on the ordinary Selangor alluvial soils.

Water from Lapan Utan Rubber Co., Ltd.

PARTS PER 100,000.

Total Solids	42.000
Chlorine	15.000
Free Ammonia	0.040
Albuminoid Ammonia	0.150
Nitrates and Nitrites	2.000
Nitrites	Present

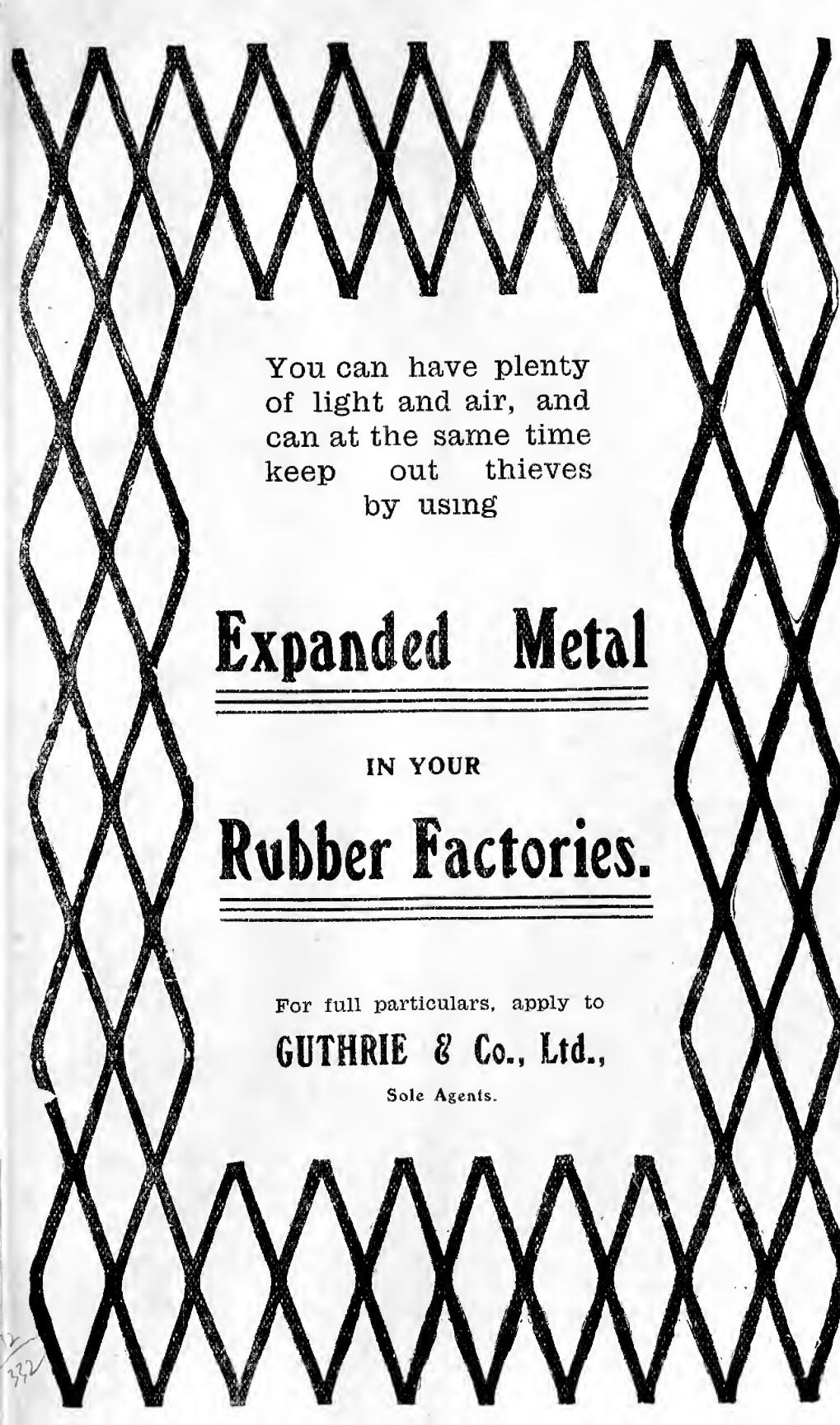
I certify that this water is so polluted as to be unfit for human cnesumption.

DAMARS.

The following article on local Damars will be read with interest. These resins are produced by a number of the large Dipterocarpous trees, natives of the Malay peninsula. They are usually collected by natives searching in the forests for spots where old trees have decayed or where masses of the resin are to be found lying in the soil, having dropped from the trees. Locally the substance is chiefly used for damar torches, caulking boats, etc. In the home trade they find their way into varnishes.

The most valuable are the transparent resins such as those from the *Balanocarpi*, known as Penak or Chengei and the Mata Kuching Damar from Hopeas. The resins from Shoreas are usually opaque, yellowish or brownish, and rather chalky. The black resins often in long pipes often met with in the forests are usually the produce of some species of *Canarium (Burseraceae)*. They are apparently not much valued on account of their dark colour. Some years ago an attempt was made to start a Damar industry near Raub by tapping *Balanocarpus maximus* but we have not heard more of this movement. Bulletin VI. 138), and Mr. Moorhouse published an account of Damar tapping in Bulletin IV., p. 124 (See also Damars and wood oils by H. N. Ridley, Journ. Roy. As. Soc No. 34, p. 89).

Manila Copal or Almaciga is obtained from the coniferous tree *Agathis alba* or *Damara alba*. Some account of this is given by Mr. Foxworthy in the Philippine Journal of Science, May 1910 p. 173. The resin found in hard lumps in the forks of trees or in masses in the ground at the base, is collected by the Tagbuanas of Palawan. The tree also occurs it appears, in Borneo, on Mt. Poe, Sarawak, where Beccari found the resin at the foot of the tree. It is collected by the Dyaks, and Beccari gives the name of Dammar Daghin (Damar Daging) to it. This name, however, is usually applied to the resin of one of the Shoreas. Mr. Foxworthy found the Land Dyaks collecting it there under the name of Damar Bindang. They ascended the tree by a ladder of pegs driven into it and tying saplings thereto and by this means collected the resin on the branches. Warburg (Monsunia 1 182-185) gives the Damara of the Malay Peninsula as a different species under the name of *Dhomboiaalis*. It is abundant and of large size on the Taiping hills and on Penang hill and produces much turpentine, but this does not seem to set into the clear hard blocks which are obtained from Manila. I have seen a stream of the turpentine flowing across the path up the Taiping hills where a root had been cut. The Malays call it Damar minyak, oil damar which rather impies, that it does not set hard. Manila Copal is much valued and it would be worth while investigating our Damara trees to see if a similar product not be obtained.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For full particulars, apply to
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Dammar.

The dammars form a group of resins characterised by being largely soluble in spirits of wine or oil of turpentine and therefore suitable for the preparation of so-called "spirit varnishes" used mainly for indoor woodwork, paper, cloth, etc. They are obtained from species of *Hopea*, *Shorea*, and *Balanocarpus*, mainly in the Federated Malay States as well as in Sumatra and other Dutch East Indian Islands. Small quantities of dammarlike resins are obtained in India, but so far as European commerce is concerned these are of no importance. The dammars are all collected from living trees. The Dutch East Indian resin is shipped chiefly from Batavia, whilst the product of the Federated Malay States reaches Europe via Singapore.

The value of Singapore dammar in London at present is 25s. to 67s. per cwt., whilst that from Batavia is worth 65s. to 70s. per cwt.

Dammar Resins from the Federated Malay States.

These dammar resins, produced in the Federated Malay States, were forwarded to the Imperial Institute by the Conservator of Forests in 1905, with the request that information might be supplied as regards their suitability for varnish-making and their probable commercial values in this country.

Description of Samples.

No. 1. (Dammar Penak, No. 1 quality, derived from *Balanocarpus maximus* or *Wrayi*):—The sample weighed nearly one pound, and consisted of tears agglomerated into masses of light yellow transparent resin. It was brittle, readily reduced to powder, and appeared to be quite free from any foreign matter. It was partly soluble in alcohol, completely so in ether, and almost entirely soluble in turpentine, forming a slightly opalescent solution, which when applied to sized wood, dried to a brilliant, transparent, hard, and almost colourless "coat."

No. 2. (Dammar Kumus, from a Shorea sp., rather like *Shorea glauca*, probably *S. ciliata* Ed).—The sample weighed about four ounces, and consisted of two small masses of reddish-brown resin, which was translucent in thin pieces. It was partially soluble in alcohol, and almost completely soluble in ether. The solution in oil of turpentine was dark coloured, and when applied to sized wood left a fairly hard, brownish "coat" which was not very glossy.

No. 3. (Dammar Mata Kuching, Port Dickson).—This sample weighed about 1.5 ounces, and consisted of small, roughly ovoid, slightly yellow transparent tears of resin. It was hard, and free from foreign matter, and dissolved partially in alcohol and completely in ether. The solution in oil of turpentine was clear, and when applied to sized wood left a hard, brilliant, nearly colourless "coat."

No. 4. (Dammar Soongyi) (Sungei).—This weighed nearly fourteen ounces, and consisted of irregularly shaped lumps of dark-brown resin, which was translucent in thin pieces. The resin was hard; it dissolved partially in alcohol or ether and completely in oil of turpentine, forming a brown opaque solution which dried on wood, leaving a light brown, soft, dull "coat."

No. 5. (Dammar Meranti, derived from various *Shoreas*, of inferior quality).—This sample weighed about twenty ounces, and consisted of a single lump of opaque, yellowish-white resin, which was friable and softened readily when rolled between the fingers. It was partially soluble in alcohol or ether, and formed with oil of turpentine an opaque varnish which when applied to wood left a dull and sticky "coat."

No. 6. (Dammar Mata Kuching from Jempol).—The sample consisted of a lump of hard, transparent, pale amber-coloured resin, weighing about seven ounces. It was free from foreign matter and was partially soluble in alcohol and completely soluble in ether. It dissolved in oil of turpentine to form a pale yellow transparent solution, which dried on sized wood, forming a hard, brilliant, and almost colourless varnish similar to that produced by Sample No. 1.

No. 7. (Dammar Rengkong ?).—This weighed about two ounces, and consited of small pale yellow, hard and transparent tears. It was partially soluble in alcohol or ether and dissolved completely in oil of turpentine, forming an opalescent solution, which dried on sized wood leaving a "coat" which was hard, but lacked gloss.

No. 8. (Dammar Merawan from a Shorea).—The sample weighed nearly two ounces, and consisted of large translucent, yellowish-white tears of resin. It was partially soluble in alcohol, completely so in ether, and formed an almost colourless solution in turpentine oil, and this on drying left a fairly hard, clear, glossy "coat" inferior to those produced by Nos. 1, 3, and 6.

No. 9. (Dammar strayah) (Seraya).—This weighed about five ounces, and consisted of lumps of pale yellowish-brown resin showing a laminated structure. It was partially soluble in alcohol or ether. The solution in oil of turpentine dried to a fairly hard "coat" which was devoid of gloss.

Chemical Examination.

The nine samples of resin, when chemically examined, gave the results recorded in the following table:—

	No. 1.	2,	3,	4,	5,	6,	7,	8,	9
Melting point	90°c	94°c	87°c	189°c	185°c	92°c	200°c	97°c	190°c
Ash per cent	0.26.	0.08.	0.05.	0.52.	0.03.	0.06.	0.04.	0.25.	0.09
Saponification number *	46.7.	72.0.	38.5.	34.3.	72.0.	33.0.	46.7.	38.5.	55.0
Acid number *	45.3.	72.0.	38.5.	33.0.	72.0.	33.0.	46.5.	38.5.	55.0
Ester number *	1.4.	—	—	1.3.	—	—	0.2.	—	—

* *Milligrams of potash required for one gram of resin.*

The results of this examination show that these resins exhibit considerable differences in chemical composition and properties. They are all, however, partially soluble in alcohol and completely soluble in turpentine oil forming fairly light-coloured varnishes, and would therefore be classed commercially as dammars.

Commercial Valuation.

Samples of the nine dammars were submitted for valuation to commerical experts, who were also informed of the results of their examination. They reported on the samples as follows :—

Number of Sample	Description.	Commercial experts. comment.	Commercial values estimated by experts.
1.	Dammar penak	"Clean pale yellow"	55s. to 60s. per cwt.
2.	„ Kumus	"Black"	20s. per cwt.
3.	„ Mata Kuchtng	"Pale drop"	70s „
4.	„ Soongyi	"Black"	15s „
5.	„ Meranti	"Chalky"	10s „
6.	„ Mata Kuching	"Bold pale"	60s „
7.	„ Rengkong	"Green like Ceylon"	35s „
8.	„ Merawan	"White"	35s „
9.	„ Strayah (Serayah)	"Chalky inferior"	5s to 6s per cwt.

The prices quoted for the better qualities of the dammars included in this series of samples compare very favourably with those obtained in the open market in London, thus on the November 1905, the better qualities of Batavia dammar were quoted at from 70 s. to 80 s. per cwt. and Singapore kinds at from 30 s. to 75 s. per cwt. (November 1905).

(Colonial Reports Miscellaneous No. 63 Imperial Institute Gums and Resins 182)

OIL FROM RUBBER TREE SEEDS.

The United States Consul-General at Singapore suggests that the oil of seeds of *Hevea Braziliensis* will ultimately be of great commercial value. He recalls that it was a long time before the oil of cotton seeds became a valuable commercial factor. The Consul-General (Mr. Dubois) reports that at present there is such a demand for the seeds of *Hevea* for planting that the supply is not sufficient. It is now suggested by experts, however, that in erecting machinery on new rubber plantations the plans should be made with a view to rubber seed crushing machines being included later. This would leave a residue on the estates which it is believed will prove good for cattle food, as well as a fertilizer for rubber trees. (United States Daily Consular and Trade Reports, September 13, 1910).

At a recent meeting of the United Planters' Association of South India, Mr. R. D. Anstead mentioned that a large number of Para rubber trees planted in that country are already beginning to bear seed, and each year more will do so. It has been estimated that trees after the fifth year will yield 500 seeds each, and the product of 400 trees will weigh a ton. It is stated that the seeds contain about 20 per cent of an oil which has been valued at $100 (gold) per ton. Mr. Anstead was of opinion that the planters should gather the seed, crush it for the oil, and use the residue for fertilizing the rubber plantations:—(The India Rubber World, Vol. XLIII., p. 16).

"The comparisons of rubber seed with linseed and cotton-seed have led to inquiries as to the possible commercial utilisation of rubber-seeds in the future. At present there is such a demand for seeds for planting that there is no surplus supply. The Botanic Gardens at Singapore—which is really the birth-place of the Malay rubber-industry have already furnished great quantities of seed for the plantations, but the authorities now refuse to undertake any more orders for seed before next spring owing to the engagements already booked. But the time will not be long in arriving when there will be a large surplus of seeds from the ninety millions of trees already planted. Scientific investigation of the rubber-seeds has proved that they yield a fine clear oil of good drying quality. It has recently been suggested that, having in view the future commercial value of the seeds, it would be wise in erecting new machinery on plantations to make provision for power and space for seed-crushing machines. By doing so the residue from the crushers, which is valuable both as cattle-food and for fertilising, would be left on the estates."

(The Chemist and Druggist Vol. LXXVII p. 63).

We understand that there is just now rising a strong demand for oil of Para rubber seed in the United States of America. The failure of the linseed crops, and the substitution of the cultivation of the soy bean for the linseed by many planters has left the consumer of this oil short, and this is probably the cause of the interest now taken in Rubber seed oil.

Reports and notes on this oil have been already published in the Bulletin, but in the days when the attention of planters was called to this product all seeds were required for further planting, and since then the production of the rubber has been naturally the sole objective of the planter who has not bothered about the minor product.

Now, seed is abundant, and it would doubtless be possible to bring this product into the market and so to add to the profits of the estates. In clean weeded estate it should not be difficult for women and children to collect large quantities of seed at a cheap rate, they being paid by results. The seed could be shipped to the oil-mills, and there sold.

Only to-day a merchant was enquiring where a few tons of the oil were to be had for shipment to America, and it is certain that the oil would fetch a ready sale were it procurable in large quantities especially at the present time:—Ed.

Para Rubber-Seed Oil.

(*Extracts from Chemist and Druggist.*)

Attention is again called to this article of future commerce in several papers owing to the shortage of linseed oil this year. The amount of rubber seed in the Peninsula now practically wasted is very large and some addition to the profit of the industry might certainly be made from the seeds. On clean weeded estates, in the season it should be possible to gather or sweep up the seed at a comparatively small cost and supply it to the oil-mills, where it could be crushed and the oil extracted, the residue being made into oil-cake.

The great scarcity of linseed oil is causing much anxiety among consumers. The paint trade has been making a large use of substitutes but for wagon sheet making, oilcloths, etc., nothing can take the place of linseed. The present quotation for linseed is higher than it has been for twenty years, and 100 per cent higher than this time last year. The failure of the linseed crop and the occupation of many of the mills in soy bean crushing seems to be the causes of this rise in price (extract from chemist and Druggist, October 1, 1910). Now it seems would be the time to put Para seed oil on the market as a substitute for linseed. The following quotations from the same journal for will be of interest.

OBITUARY.

DR. MELCHIOR TREUB.

By the death of Dr. Treub the world loses its greatest tropical agriculturist and administrator of cultural establishments, and we could not pass over the death of one who has done so much for agriculture in the East without expressing our sense of the sad loss of so great a man. Dr. Treub was born at Voorschoten, near Leyden, on December, the 26th 1851, and after completing his undergraduate career was appointed assistant in the Botanical Institute of the University of Leyden, in 1874, and in 1880 was appointed to the Directorship of the Botanic Gardens at Buitenzorg, (being then only 29 years of age), succeeding Dr. Scheffer.

Through his energy and perseverance he raised the position of the Buitenzorg Gardens to the highest rank of any gardens in the world. Aided by a sympathetic government and his own great powers of administration he developed the economic functions of the establishment to the utmost, increasing the area under cultivation, and the staff, and adding the finest Botanical Laboratories in the world. He persuaded his Government to provide special laboratory accommodation for foreign workers, a very large number of whom came to

take advantage of the facilities offered for original research. The results of these extremely important works were published in the Annales du Jardin Botanique de Buitenzorg, Teysmannia, and other Journals. The "Annales" were founded by Scheffer, who published the first volume, and thence forward carried on by Dr. Treub.

Besides his vast administration work he found time, too, to publish many important papers on his own special studies.

In organizing the Scientific Department of Agriculture he visited many of the other botanical establishments of the East, and on several occasions visited the Singapore Botanic Gardens. In the course of one of these investigations in Manila he contracted a severe illness from which it appears he never really recovered, and a little more than a year ago it was found necessary for him to retire from his post, first to Egypt and then to the South of France, where he died on October 3rd, at the age of fifty-eight, after a service of nearly 30 years in Java.

He will be deeply missed by many who knew him, not only as a most able administrator and agriculturist, but also as a kind and helpful friend, full of encouragement and sympathy for humbler workers:—Ed.

DR. W. BURCK.

We have also to record with regret the death of Dr. Burck who was formerly attached to the Botanic Gardens at Buitenzorg. He was born in 1848 and was well-known from his studies in the *Dipterocarpeæ* and *Sapotaceæ*. He was particularly interested in the cultivation of Guttapercha and for the study of their product visited the Highlands of Sumatra in search of plants. He collected a large number and started the Tjepetir and Guttapercha plantations, where Dichopsis gutta and other species are cultivated in a large scale. Later he was put in charge of the Government coffee plantations, and retired about eight years ago to Leyden where he devoted himself to Botanical science.—ED.

PERSONAL.

Mr. F. G. Spring, of the Aberdeen and North of Scotland College of Agriculture, Aberdeen University, has arrived and assumed duties as Assistant to the Director of Agriculture, and Superintendent Government Plantations, F.M.S., vice Mr. J. W. Campbell, resigned. Mr. Spring holds the National Diploma in Agriculture and the University Diploma.

Mr. W. L. Wood, late of the Kew staff, has arrived and assumed duties as Superintendent of Government Plantations, Perak. Mr. Wood, after leaving Kew was for some months assisting Dr. Henry in his work on British Forestry.

MINUTES OF MEETING.

Held at the Masonic Hall, Kuala Lumpur, at 11-30 a. m. on October 23rd, 1910.

PRESENT.

Chairman :—Mr. C. M. Cumming.

For Kuala Langat District Planters' Association :—Mr. F. J. Dupuis.

Johore Planters' Association :—H. M. Morschell.

Kuala Lumpur District Planters' Association :—Messrs. F. G. Harvey, E. B. Skinner, H. C. E. Zacharias.

Klang District Planters' Association :—Mr. E. B. Prior.

Negri Sembilan Planters' Association :—Messrs. W. Buyers, A. Dupuis Brown, J. B. Douglas, A. B. Davidson.

Legal Adviser :—Mr. G. H. Day.

Visitors :—Messrs. K. J. Thorpe, M. Sharpe Smith, F. G. Hubback, B. J. Eaton, A. M. Pountney, Hon. C. W. Darbishire.

1. The Notice convening the Meeting having been read, Mr. Cumming says, that before proceeding with the business of Meeting he must say a few words with regard to the untimely death of Mr. W. W. Bailey. As they were all aware, he was for some years chairman of this Association and he was a splendid planter, a good sportsman and a good friend, and he did not hesitate to say that partly owing to his unswerving faith in the prospects of plantation rubber many of them by the force of his example were encouraged to go on planting up. He felt sure they would all join with him to-day in recording the great sympathy they felt for Mrs. Bailey, in her bereavement. The Secretary had already telegraphed to her the condolences of the Planters' Association of Malaya.

Mr. E. B. Prior says that there had been a suggestion to hold a memorial service for Mr. Bailey, and he had discussed the matter with the Rev. P. G. Graham, but in view of the fact that the majority of Mr. Bailey's old friends had left the country it had seemed that it would be somewhat out of place. It was felt that as Mr. Bailey was the pioneer planter at Klang, it would be appropriate that there should be a memorial in Klang, and the Chaplain had suggested placing a pulpit in Klang Church.

Mr. Cumming seconds this proposal.

Mr. Zacharias, reminding the Meeting that Mr. Bailey, after the federation of the Planters' Associations and the formation of the U. P. A., was the first chairman of that body, thinks it appropriate that, as the Planters' Association of Malaya was the continuation of the U. P. A., something should be done to mark the appreciation of the Association as such. The personal esteem of the planters might be marked separately, *e.g.* by the forming of a "W. W. Bailey Memorial Fund" for endowing Scholarships at the Straits and F. M. S. Medical School.

Resolved that a sum not exceeding $500/—from the funds of the Planters' Association of Malaya be devoted to the erection of a pulpit in Klang Church as a Memorial to the late Mr. W. W. Bailey.

2. The Minutes of the previous Meeting are taken as read and confirmed.

3. PLANTATION PRODUCE PROTECTION ENACTMENT.

The Legal Adviser reports that this Draft Enactment meets all the suggestions previously brought up by this Association for the amendment of the "Praedial Produce Enactments."

4. ABSCONDING COOLIES.

The Secretary reads the following letter:

Federal Secretary,
F. M. S.
Kuala Lumpur. 2nd August, 1910.

SIR,—At the last Meeting of my Association held on 18th instant, I was instructed to submit that the Labour Enactment be amended so as to make it an offence punishable with imprisonment for a laborer to abscond, without having given due notice.

I have etc.,
(Sgd.) H. C. E. ZACHARIAS,
Secretary.

Mr. G. H. Day reports that this suggestion has been adopted in the Labor (General) Draft Enactment, which was shortly to come before the Federal Council.

5. LONDON EXHIBITION.

The Secretary reads the following correspondence:

H. C. E. ZACHARIAS, Esq., LONDON, W.C.,
Kuala Lumpur. 4th August, 1910.

DEAR SIR,—I thank you for yours of the 6th July, re 2,806 sq. ft. of space, block 3/4. This has been reserved; we received official notification from the Colonial Secretary, Singapore, by letter: dated 25th April, and I thank you for confirming same.

Re space 1/2 this has been reserved by Ceylon but I think 2/4 equally good if not better. If I find that it is possible to alter the positions I shall have great pleasure in meeting your wishes.

Malay Cottage. I still have this stored in case you require to use it at the next Exhibition. I am afraid you would require some fresh roofing, though not a very great deal. There are no kitchen utensils but to the best of my belief the whole of the woodwork is complete; it has been lying in the store where it was placed at the close of the last Exhibition.

It is advisable to send over a good supply of stumps showing the various tappings if you can, and they are bound to draw attention like they did at the 1908 Exhibition, also live rubber plants and special decorations. Some of the photos you sent before were too small. It would be better not to have so many and have them much larger; you can get them enlarged cheap enough in London.

I am only making these suggestions for the benefit of the Exhibit.

What few photos Ceylon had were very large and could easily be seen.

If your Committee wish, I can get out a design for your stand though I presume you will send over a portion of it to give it the look of Federated Malay States and Straits Governments; it would look more natural, than if it were made wholly of English design. It will be necessary to have a platform down.

There is one thing I would like to impress upon you, viz., next year being Coronation which will take place shortly before the opening of the Rubber Exhibition on the 24th June, every one, especially standfitters, will be extremely busy and all arrangements therefore in connection with the buildings of the Stands should be made well in advance.

Yours truly,

(Sgd.) A. STAINES MANDERS,
Manager.

H. C. F. ZACHARIAS, ESQ.,
Kuala Lumpur.

London,
31st August, 1910.

DEAR SIR,—In reference to the F.M.S. and Straits Settlements it is to be hoped that the Committee arranging the representation of the two Colonies at this Exhibition, will see that no private firms have articles or goods placed on the Government space as if they did, it would take away from special nature of the exhibit and turn it into an ordinary general commercial stand instead of a representative Rubber Exhibit.

Why I mention this is, that at the last Exhibition several Exhibitors of rubber utensils, knives, seeds, also engineering firms had their goods shown free on the Government space when their proper place was in the commercial section where they would pay for space in the ordinary way. I am sure you will as all other Government Representatives have done, agree though I do not expect any one over there will try but just mention the matter in case. This of course does not apply to raw rubber, or other products, but ordinary commercial exhibits.

Yours truly,
(Sgd.) A. STAINES MANDERS,
Manager.

The Secretary,
Rubber Growers' Association,
1 Oxford Court,
Cannon Street,
London, E. C.

6th October, 1910.

DEAR SIR,—As you are aware, the second International Rubber and Allied Trades Exhibition will be held in London, during June next.

As it is essential that this Peninsula should make an imposing Show, a commanding position has already been booked and the co-operation of the S. S. and F. M. S. Governments has likewise been secured.

We feel sure you will agree with us, that it will be most desirable to concentrate the energies of everybody connected with the Rubber Industry in this Peninsula, on getting up one really representative stand rather than have a multitude of disjointed exhibits serving merely private ends.

It is, therefore, proposed to ask all our producing estates to send samples of not less than 25 lbs. each to this office at a date not later than April 2nd, 1911, when a select Committee will judge at a preliminary local Show all these exhibits and choose from amongst them such as they will consider best suited to advertise the quality of the various grades of rubber produced in this country.

In addition a large model is being got up, showing part of an estate, model coolie lines, machinery and drying sheds, assistant's bungalow, etc.

We merely give you a sketch of what we are doing, for your information, and will supplement this from time to time.

In the meantime we should be very glad if we could count on your co-operation in this matter, by recommending to your members, to give us their support, both by sending us samples of their rubber, as aforesaid, and by contributing to the expenses of the whole undertaking.

The latter we estimate at quite $10,000/-, and we therefore shall have to depend on donations, limited to say £50/-, from all those who are interested in the Staple Industry of this Peninsula.

Thanking you in anticipation, we are, dear sir,

Yours faithfully,

(Sgd.) H. C E. ZACHARIAS,
Secretary.

Mr. Cumming urges all planters to co-operate to make a first-class show, and refers to the local show which is to be held here in April, when a Committee will select the best samples to be sent Home. It was the wish of the Committee to have a really representative exhibit, and no expense should be spared.

Mr. Skinner proposes that all companies be circularised and asked to contribute a sum not exceeding $200/—each ; the surplus, if any, to be refunded.

Mr. Harvey seconds, and the resolution is carried unanimously

6. COMPULSORY GRADING OF AGRICULTURAL PRODUCE.

Mr. Prior thinks such a thing as compulsory grading of rubber impracticable.

Mr. Skinner presumes the idea was to prevent tapping immature trees, but it was surely a dangerous thing to leave it to Government to decide, which tree was immature, and which was not.

Mr. Cumming deprecates further interference by Government and restriction of the liberty of the subject.

Mr. A. Dupuis Brown says that a similar question arose in Egypt over cotton, and the Association there definitely fixed certain grades. In view of the methods adopted by the Malays the question was a very important one.

Mr. Prior says that the Malay was not the direct exporter, as he sold to the European.

Mr. Dupuis Brown proposes, Mr. Skinner seconds, and it is carried unanimously, that a sub-committee be appointed to consider the question, with power to correspond with Government, and report to the P. A. M., at the next meeting. Messrs. Skinner, Dupuis Brown and F. G. Harvey are appointed members of the sub-committee.

7. BRUSSELS EXHIBITION.

The Secretary reads the following correspondence :

The Secretary, 8th September, 1910.
Planters' Association of Malaya,
Kuala Lumpur.

DEAR SIR,—We beg to enclose a copy of a letter received from Messrs. Lewis and Peat together with an account of the rubber purchased for the Brussels Exhibition.

You will notice that there remains to be received the account for the sale of the exhibits which will be rendered together with account for the purchase, on arrival from London.

We shall forward to you the photographs of the exhibits on receipt.

We are, Dear Sir,
Yours faithfully,
(Sgd.) THE PLANTERS' STORES & AGENCY CO., LTD.
6, Mincing Lane,

Lewis and Peat 12th August, 1910.
Messrs. The Planters' Stores & Agency Co., Ltd.,
Kuala Lumpur.

DEAR SIR,—We very much regret having omitted to write exactly what we had done, as to exhibits on account of the Malay Planters' Association in the Brussels Exhibition. On the 1st April we informed you that the quantity you named was far too much ; we had been in communication with the man who had charge of the rubber section at the Exhibition, and learnt from him that this was to be shown in a somewhat small pavilion, about 7 miles from the main Exhibition, which would be entirely devoted to rubber. The writer was on the Committee for the Rubber Growers' Association of London, and discussed the matter with them before deciding the quantity to be sent ; he also got together their exhibit and he visited the exhibition himself with other Members of the Association, and found that the samples sent along were fully sufficient, and with the photographs supplied and the big name board of the Malay Planters' Association made an excellent exhibit. We enclose the invoice now, leaving out a small item of insurance, for which we have been waiting for some time.

The section, being so far away from the main exhibition, is only being visited by comparatively few of the general public, but by a great many people actually interested in the article.

When the Exhibition closes, we hope to be able to get a fair price for the samples from buyers in Brussels.

We are, dear sirs,
Yours faithfully,
(Sgd.) LEWIS & PEAT.

P. S.—We hope to send you a photograph of the exhibition next mail.

6, MINCING LANE LONDON, *12th August, 1910.*

THE PLANTERS' STORES AND AGENCY Co., Ltd.

DR. TO LEWIS AND PEAT.

For Amount of the following goods.

LOT SAMPLES RUBBER FOR BRUSSELS EXHIBITION.

				£	s.	d.
1.	5 lbs. Ceara Biscuit	@	10/ 7½	2	13	3
2.	10 „ Pale Para Blanket Crepe...	„	7/ 6	3	15	0
3.	10 „ „ „ Biscuit	„	11/10¾	5	19	0
4.	10 „ Dark „ Crepe	„	11/ 7	5	15	10
6.	20 „ Fine Pale „	„	11/ 9½	11	15	10
5.	50 „ Black	„	12/ 2	30	8	4
7.	20 „ Brown Crepe	„	11/ 7½	11	12	6
8.	15 „ Fine Para Sheets	„	12/ 5¼	9	6	7
				81	6	4
	Discount 2½ %			2	0	8
				79	5	8

Charges.

1.	Sampling, supplying bag and porterage	2. 8			
2.	„ „ „ „ „	4. 2			
3.	„ „ „ „ „	4. 2			
4.	„ „ „ „ „	8. 1			
6.	„ „ „ „ „	4. 2			
5.	Delivery and forwarding case	1. 6			
7.	Sampling, supplying bag and porterage	8. 0			
8.	„ „ „ „ „	4.11			
	Case for samples	4. 6			
	Forwarding to Brussels P. G. E. Ry. ...	1. 0			
	Freight	5. 0			
	Insurance to Brussels	3. 9	2	11	11
			£ 81	17	7

Mr. Skinner reports having, while at Home, visited the Brussels Exhibition, and gives the meeting a short account of the Malayan rubber exhibit there. It was situated in a big marble palace, some seven miles out, which was lent by the King of Belgium. Exhibits of Congo industries were in the same building, and thousands of people visited it. The Malayan rubber exhibit was a good one, comprising crepe, block sheet, tapping photos, etc.

8. STRAITS MEDICAL SCHOOL.

The Secretary places on the Table an Appeal for a Scholarship Fund by the Dean of the Straits and F.M.S. Medical School.

Mr. Harvey says that what was wanted was the class of medical practitioner known as "Assistant Surgeon" and it was exactly this class, which was being trained at the Straits School.

Mr. Prior reckons that the demand was more than double the supply. This was the crying need of the country, as without them they were unable to carry out the Hospital, &c. regulations.

Mr. Cumming emphasizes that more and more would be wanted as time went on, and they should do everything in their power to encourage the Government's scheme to raise up a class of qualified dressers for its own use and that of the planters.

It is proposed by Mr. Prior, seconded by Mr. Douglas, and carried unanimously, to send out a circular, accompanied by the appeal, to all members, asking for the largest contribution they could give, in order to form a W. W. Bailey memorial fund for the endowment of scholarships at the Straits and F. M. S. Medical School.

9. CENSUS.

The Secretary reads out the following letter:

No. 5224/1910. 29th September, 1910.

SIR,—I am directed to invite your attention to the selection of the night of Friday, March 10th, 1911, as the time for the taking of a census throughout the Federated Malay States and to say that the Resident-General feels assured that all officers engaged on the census will have the cordial co-operation and assistance of your Association and of the Planting Community generally in securing that all information required for the purposes of the Census in the Federated Malay States is fully and accurately given.

2. I am also to inform you that all correspondence on census matters addressed to Census Officers will be transmitted free by post.

I have etc.,
(Sgd.) E. C. H. WOLFF,
for Federal Secretary.

At the invitation of the Chairman, Mr. A. M. Pountney then explains the co-operation required of estate managers in the matter of the forthcoming census, by a sketch of the census operation.

An estate for census purposes was an area under cultivation, on which there is a resident labour force of ten or more coolies, and in respect of the residents on which area the manager is requisitioned by the District Census Officer to act as Enumerator.

Census returns would be published of the population of all agricultural estates so selected.

The numbering of the houses about to be undertaken in country districts was necessary in order to estimate the number of householders' schedules required and also in order to afford the best possible itinerary to the official enumerators.

In the case of estates in which the manager was ex-officio enumerator the actual numbering of the houses was left to the Manager's discretion, all that was required was that he should ensure the enumeration of every person sleeping in any building on his estate on the night of March 10th, 1911.

Managers were requested to notify the District Officers of any instances of houses within the boundaries of their estates having numbers affixed to them by the official numberers. In such cases the houses in question would be excised from the District House List.

The total number of houses on an estate was, however, required for Census purposes and the number of persons resident thereon was also required to render it possible to estimate the nunber of the householders' schedules to be issued to the estate.

For these reasons Managers would be requested to furnish information on Census Form 9, Estates Statistical Return.

As regards the item "Planted Area" of estates, the total planted area of all estates in a district was the only derived figure which would be published, and no figures in respect of individual estates would be divulged. On receipt of Form 9 from estates an estimate of the schedules required for each estate would be made and this estimated number of schedules would be forwarded to the manager by the middle of February, 1911. There would, thus, be time for managers to report any shortage of schedules to the District Officer before enumeration commenced. In the case of estates, the managers would probably have to appoint persons to carry out the preliminary enumeration and make the entries for the coolies on the schedules. Any person so appointed should be thoroughly capable of filling in schedules correctly and neatly in English.

The various houses on the estate should be divided up amongst the persons appointed to carry out enumeration in such a manner that all houses on the estate are allotted to some enumerator or other. During the three or four days prior to the Census day, the 10th March, 1911, the enumerators should fill in the particulars required in respect of all persons living in the houses allotted to them and the Manager should be in possession of all schedules by noon on the 10th March, 1911, to afford an opportunity of seeing that they are properly filled in.

Coolies should, as far as is reasonable, be prevented from leaving the estate on the night of 10th March, 1911, and early on the morning of the 11th March the manager should hold a muster or musters of all persons on the estate at convenient places. He should check the

schedules by a roll call and add particulars in respect of all persons who were not on the estate during the preliminary enumeration, but slept there on the night of the 10th March, and should excise all entries in respect of persons resident on the estate during preliminary enumeration, but who did not sleep on the estate on the night of the 10th March.

During the final enumeration by the manager (or Assistant Managers) all houses on the estate should be searched to see that no one escaped enumeration.

The manager would then be required to sign the schedules and forward them, without delay, to the Assistant Superintendent of Census, that is the District Officer, for the District within which the estate was situated. Rules for the enumeration of estate population and specimen schedules properly filled in would be issued to estate managers with the householders' Schedules about the middle of February, 1911.

The Meeting then adjourns (at 1-15 p.m.) for a tiffin interval, and resumes the sitting at 2-30 p.m.

10. CHINESE LABOUR.

The Secretary reads out the following letters:

Chinese Protectorate,
P. of C. 619/10. Singapore, 23rd September, 1910.

GENTLEMEN,—I have the honor to enclose a copy of the form of contract to labour approved by His Excellency the Governor in Council for use under the Chinese Immigrants Ordinance, 1902, as it is about to be amended.

2. The Bill to amend this Ordinance has been published in the Government Gazette, and will probably become law about the 6th October. Similar legislation is also in contemplation in the Federated Malay States.

3. The enclosed form of Contract, with the addition of certain clauses (providing for the return of the laborers on determination of the contract to the Colony or China as the case may be, and for the cancellation of the Chinese Immigrants' contract on the terms laid down by section 32 of the Chinese Immigrants' Ordinance) will probably be approved for use under the Emigration Ordinance, 1910, which will soon be brought into force.

4. In the case of emigrants who do not also come under the "Chinese Immigrants Ordinance" there will be standard varieties of this form of contract, similar to those in use at present.

5. This letter is written to give employers and their agents early intimation of the change in the form of contracts and to draw attention to the impending alteration of the law. It is possible, but not probable, that further changes will be made in the contract, before it is gazetted.

I have, etc.,

(Sgd.) C. J. SAUNDERS,
Secretary for Chinese Affairs.

ENCLOSURE.

This Contract made the.....day of.....191 between each of the persons named and described in the schedule hereto (hereinafter called the Labourer) of the one part and .....of..... ....his executors and administrators (hereinafter called the Employer) of the other part.

Witnesseth that, whereas the Labourer has received from the Employer advances to the amount hereinafter written against his name, the receipt of which advances the Labourer hereby acknowledges,

NOW it is hereby agreed between the parties as follows :—

1. The Labourer will proceed to.....at the expense of the Employer and will there labour for the Employer as.. .....

2. The Employer may require the Labourer to perform this contract under any headman, mandore, contractor or other person, provided that the Employer shall remain responsible to the Labourer for the due performance of the following conditions and for the good treatment of the Labourer.

3. The Employer will make no deduction from the Labourer's pay for any advances made to the Labourer, or for the cost of the following articles now supplied to the Labourer: one mosquito curtain, one sun hat, one coat, 2 pairs of trousers, 2 bathing cloths, one pair of clogs, one blanket and one mat or for any expenses incurred by him on account of the Labourer prior to the arrival of the Labourer at the place where the contract is to be performed.

4.—(i) The Labourer will complete an aggregate number of (not exceeding 300) day's work and will work overtime when reasonably required by the Employer so to do.

(ii) Not exceeding nine hours shall constitute a day's work, but the Employer may reckon as a day's work the completion of an equivalent task previously determined by him, provided always that the local authority of the place where the contract is to be performed may at any time alter or revise such reckoning, if the task so fixed appears to him in the case of the Labourer to be unreasonable.

5. Except in case of emergency such as fire or flood, the Labourer need not work more than 26 days in any month nor upon the usual Chinese feast days which shall include the following :—

Chinese New Year (2 days)	5th of the 5th moon
15th of the 1st moon	15th of the 7th moon
Ching Ming	Tung Tsit.

6. The Employer will during the continuance of the contract provide the Labourer free of charge and to the satisfaction of the local authority of the place where the contract is to be performed with suitable house accommodation, with sufficient food of good quality, with medical attendance and treatment, with tobacco and with the services of a barber.

Provided that the Employer may charge the Labourer 15 cents for the food supplied to him on any day, over and above 4 days in any month, on which he is absent from work, if his absence is not due to sickness or to other cause beyond his control.

7. If the Labourer shall abscond and be arrested, he shall be liable to pay to the Employer such expenses of his arrest as the local authority of the place where the contract is to be performed may deem reasonable.

8.—(i) The Employer will at regular intervals of not over one month during the term of the contract pay to the Labourer wages at the rate of minimum eight cents for each day's work, completed by him and minimum seven cents an hour for all work done overtime.

(ii) The Employer may deduct from these payments the monies which the Labourer is liable under clauses 6 and 7 to pay to him.

9. If on the completion of this contract by the Labourer the monies which he is liable under clauses 6 and 7 hereof to pay to the Employer shall exceed the amount remaining due to him by the Employer under clause 8 hereof, the contract shall be deemed to be extended until such excess shall have been repaid. Provided that wages duirng such period of extension shall be payable at the rate of minimum twenty-five cents for each day's work.

Provided further that this contract shall be null and void on the expiration of eighteen months from the date hereof.

The Secretary,
Planter's Association of Malaya,
Kuala Lumpur.

Penang,
10th October, 1910.

DEAR SIR,—Enclosed we beg to hand you copy of a letter we have to-day forwarded to the Superintendent of Indian Immigration relating to the control which this Association advocates in reference to the importation of Chinese labour.

We are, dear Sir,
Yours faithfully,
(Sd.) KENNEDY & Co.,
Secretaries.

W. Peel, Esq.,
Ag. Superintendent of Ind. Immigrants,
Penang.

Penang,
10th October, 1910.

SIR,—We have the honor to acknowledge receipt of your letter dated the 7th instant conveying the information that His Excellency the Governor has been pleased to allow the importation of Statute Immigrants to continue to the end of the present year.

We are instructed by the Committee of the Malay Peninsula Agricultural Association to request you to convey to His Excellency their thanks for his action in so readily acceding to the representations of the Association.

We are further instructed to request you to lay before His Excellency the views of the Association regarding the immigration of Chinese labourers for agriculture.

Following the gradual extinction of Tamil Contract labour, which seems to be settled policy of the Government, the Association has to recognize that estates will, as time goes on, become more and more dependent on Chinese. The Committee therefore desires to bring to the notice of His Excellency the Governor the unsatisfactory conditions at present existing in regard to the recruiting of Chinese Sinkehs in their own country, and the harm which results through the absence of any official control by the local authorities of the recruiters. It is generally recognised and admitted that so long as the traffic remains in the hands of brokers and agents it will be impossible to ensure that only men likely to make useful agricultural labourers are exported to the Straits. At present, while very high recruiting fees are being paid, a certain number of undesirables are being brought into Malaya, and the Association feels that it is justified in regarding the future with some apprehension unless steps are taken officially to remedy the existing state of affairs. Estates are perfectly willing to pay reasonable prices for Chinese labour of a suitable class and the cost of the establishment by the Government of the Straits Settlements and the Federated Malay States of an official recruiting agency in China would easily be defrayed by recruiting fees and such an agency would benefit both the coolie and his employer by the elimination of the middleman. A certain proportion of the exorbitant recruiting fees at present paid to the brokers might then be paid to the coolie and this fact, together with the placing of the traffic under official British control, would have the further effect of cutting away the ground beneath certain misinformed persons in England who are already beginning to agitate against the employment of Chinese contract labour in Malaya.

Should the Government not see its way to establish an official recruiting agency in China, the Committee trust it may yet be possible to eliminate some of the more pressing disadvantages of the present system by the institution of a labour bureau, financed and

conducted by private individuals, but controlled and supervised by the Straits authorities. They would, however, much prefer an official agency as outlined above.

The Association ventures to hope that its views of this matter affecting so closely the interests of its members, a view arrived at after mature thought and with a due regard for the welfare both of the agricultural industry and the agricultural labourers, will receive His Excellency's sympathetic consideration.

We have, etc.,
(Sd.) KENNEDY & Co.,
Secretaries.

Mr. C. M. Cumming says that the new labour contract limited the term of contract to one year, or 300 days. Many planters in Perak, he understood, objected to this provision, and advocated a three years' term. Free labourers were preferable, but it was necessary to begin with some form of indenture. A one year indenture was now law in the Colony and they could not have another one in the F.M.S. It certainly was desirable that in the future one central labour department be instituted.

11. LABOUR ENACTMENTS.

Mr. Skinner proposes that estate doctors should have power to send Tamil and Javanese coolies to hospital.

Mr. Prior seconds, mentioning that Government prosecutes managers for not sending coolies early enough to hospital.

This resolution is passed.

Mr. Dupuis Brown proposes that the Government be approached with a view to include the undermentioned clause in the estate Laborers' (Protection of Health) Enactment, 1910:

"That Kanganies in charge of or owing coolies shall be made directly responsible under penalty for not reporting cases of sickness in the lines to their Manager, more especially cases of dysentery and advanced fever."

Mr. Day points out that this is covered by para. 27 of the Draft Enactment.

Mr. Dupuis Brown wishes the power to fine not to lie with the manager, but with the court.

Resolved that "or any magistrate upon report made to him by such resident manager" be inserted.

Mr. Day speaks on the provisions of the Chinese Immigrants Draft Enactment.

Resolved that in section 10 all the words from "and no person except" shall be omitted.

12. RAILWAY FREIGHT ON RUBBER.

The following resolution passed by the Negri Sembilan P. A. is read by the Secretary.

"That Government be informed of the great dissatisfaction caused by the raising of the railway rate on rubber from class 4 to class 2, whilst products such as cocoa, coffee and damar remain classed 3, 5 and 4 respectively, and that in comparison with Ceylon the rate in the F.M.S. works out at 25.2 cents per ton per mile, whilst in Ceylon the rates are approximately the equivalent of 7.55 dollar cents per ton per mile on the coast lines and 9.72 dollar cents per ton per mile on the main line, and that this resolution be forwarded to the Secretary of the P. A. M. to be placed before that Association for discussion at the next meeting."

The Chairman says that the raising of the rate was unjustifiable, more especially in view of the impending legislation against the Shipping Ring. It was a very drastic measure, and he thinks the Association should have been approached.

Mr. Dupuis Brown in seconding the resolution points out that rubber is now in the same category as wine, works of art, silk and walking sticks, drugs, boots and bonnets, ammunition and sealskin jackets, pianos, rickshas and perambulators, glassware, firearms and feathers, sewing machines, stationery, pickles and Chinese hair wash, statues of eminent persons and Chinese lanterns, umbrellas, tomtoms and tomb stones. The only consolation was that the rate was ½ cent less than the rate for empty coffins.

Resolved that the matter be left to the Members of Council present, who, it is understood, will raise this question at the forthcoming Meeting of the Federal Council.

13. INFECTED CLOTHING.

The Secretary reads the following letters:

Pendamaran,
Port Swettenham,
October 4th, 1910.

The Secretary,
Planters' Association of Malaya.

DEAR SIR,—The following resolution was carried at the last meeting of the Klang District Planters' Association:—

"That in view of the fact that some Planters had objected to the burning of coolies clothing at Penang the matter be laid before the Planters' Association of Malaya for discussion."

May I request you to list this subject on your Agenda for the next meeting.

Yours truly,
(Sgd.) W. H. TROTTER,
Hon. Secretary, Klang Dist., P.A.

No. (2) in 3352/10. Kuala Lumpur, 23rd August, 1910.

SIR,—With reference to your letter of July, 1910, in which you ask that the clothing and baggage of coolies arriving from India, where there is infection with cholera, should be destroyed, I am directed to inform you that the Superintendent of Indian Immigrants has been requested to give effect to this recommendation when he considers it necessary.

2. It will probably save time and prevent the reduplication of correspondence if the Secretary United Planters' Association will communicate with the Superintendent on the subject of terms, etc., if any further correspondence is necessary.

I have, &c.,

Honorary Secretary,
District Planters' Association,
Klang.

(Sgd.) R. C. GREY,
Secretary to Resident, Selangor.

Mr. Prior considers it perfectly frivolous for anybody to raise any objection to so commonsense a measure.

Mr. Cumming quite agrees and the Secretary is instructed to write to the Federal Secretary that this Association strongly approves of the clothes and baggage of all suspect Indian Immigrants being destroyed on coolies' arrival at Penang.

14. FUNDS.

The Secretary reads the following letter from the Taiping Planters' Association:—

5th October, 1910.

DEAR SIR,—At a General Meeting of the Taiping Planters' Association it was decided that as it was impossible to raise the subscription this year to meet the extra $400 required by your Association, I am requested to ask that you will allow us to have one delegate only this year, and next year we can arrange for funds to meet the extra expenses required.

The General Meeting also noted with approval that you are remonstrating with the Straits Government in bringing forward legislation dealing with planting matters without first consulting the different Planters' Associations, and I hope you will add that this Association are in very strong agreement with you.

Yours faithfully,

The Secretary,
The Planters' Association of Malaya,
Kuala Lumpur.

W. H. TATE.
Hon. Secretary
Taiping Planters' Association.

The Chairman says that the Association must have funds. It was doing good work. It was recognised by Government, and could get anything it asked for in reason. Funds were absolutely neces-

sary. It was decided that the Secretary should write accordingly to the T. P. A. and inform them that no reduction in this year's subscription could be made.

15. AGRI-HORTICULTURAL SHOWS.

The secretary reads the following letters:—

Misc. 4908/1910. Singapore, 21st September, 1910.

SIR,—I am directed by the Governor to forward the enclosed copy of the minutes of a meeting of the Standing Committee for Agri-Horticultural Shows held at Singapore on the 20th ultimo. and to request that you will kindly favour me for His Excellency's information, with any observations which the Planters' Association of Malaya may have to make upon the proposals of the Committee.

EVANS,
Ag. Colonial Secretary,
Straits Settlements.

The Honorary Secretary,
Planters' Association of Malaya,
Kuala Lumpur.

Minutes of a Meeting of the Standing Committee of Agri-Horticultural Show held in the General Secretary's office on the show ground at Singapore, on 20th August, 1910, at 8 a.m.

Present:—Messrs. H. N. Ridley (in the chair) Long, Burnside, Hall, Farrer, and Derry. After considerable discussion it was unanimously resolved to report to Government that the Standing Committee is of opinion that these Annual Joint Shows are held too frequently and they should not be held oftener then triennially.

Mr. Farrer proposed and Mr. Hall seconded that an addition be made to the Rules and regulations already drawn up. to this effect "Local Secretaries are instructed that as a general rule entry tickets should be issued to the persons actually growing or making the exhibit." Carried unanimously.

This meeting also resolved unanimously:

(1) To recommend to Government the appointment on the Standing Committee of representatives for the New States of Kelantan, Trenggann and Kedah and to invite Johore to nominate a representative or representatives.

(2) That all the members of the Standing Committee for each place in which a show is held be ex-Officio Members of the Committee of Management of such show.

(3) That the Singapore Members of the Standing Committee be requested to make recommendations for a revision of the prize list issued after consultations with the Secretaries of the Standing Committee in the other places.

(Sd.) H. N. RIDLEY.

Mr. Cumming proposes, Mr. Prior seconds and it is resolved unanimously to recommend that these shows be held bi-annually in future.

16. LABOUR CLAUSE IN LAND GRANTS.

Mr. Cumming proposes "that it is desirable that a labour clause be inserted in new agricultural grants." He thinks that steps should be taken to stop the present methods of new companies depending on labour already in the country. A clause should be inserted in the grant whereby the holder should be bound to import his labour or pay a certain sum to Government who would provide the labour required.

Mr. Prior in supporting Mr. Cumming, mentions that 80 to 100 coolies had recently left one estate within a short time without any reason.

Mr. Skinner, while in favour of the motion, suggests that its consideration should be postponed until the next meeting. This is agreed to.

Mr. Dupuis Brown suggest that the motion be discussed meanwhile by the D.P.A.'s.

Resolved to hold the next meeting at Kuala Lumpur, on December 11th.

The meeting terminates at 3-30 p.m.

(Sd.) H. C. E. ZACHARIAS.
Secretary.

Misc. 4980/10

Colonial Secretary's Office,
Singapore,
30th September, 1910.

Sir,

With reference to your letter of the 15th September, forwarding a copy of the minutes of a meeting of the Standing Committee of the Agri-Horticultural Shows, I am directed to inform you that after consultation with the Planters' Association of Malaya, His Excellency the Governor has been pleased to direct that in future Agri-Horticultural Shows are to be held biennially instead of annually.

I have the honour to be
Sir,
Your obedient servant,
(Sgd.) W. EVANS,
Acting Colonial Secretary,
Straits Settlements.

H. N. RIDLEY, ESQ.,
Hon. Secretary,
Standing Committee,
Agri-Horticultural Shows, Singapore.

EXPORTS TELEGRAM TO EUROPE AND AMERICA.

15th to 31st August.

		Steamers.	Tons.	Tons.
Tin	Str Singapore & Penang	to U. Kingdom &/or	1971	2601
Do.	do.	U.S.A.	383	250
Do.	do.	Continent	370	130
Gambier	Singapore	Glasgow	—	—
Do.	do.	London	—	50
Do.	do.	Liverpool	50	—
Do.	do.	U.K. &/or Continent	—	25
Cube Gambier	do.	United Kingdom	15	40
Black Pepper	do.	do.	160	230
Do.	Penang	do.	5	10
White Pepper	Singapore	do.	70	35
Do.	Penang	do.	—	—
Pearl Sago	Singapore	do.	100	180
Sago Flour	do.	London	125	125
Do.	do.	Liverpool	1,500	270
Do.	do.	Glasgow	25	—
Tapioca Flake	Singapore	United Kingdom	375	200
T. Pearl & Bullet	do.	do.	330	175
Tapioca Flour	Penang	do.	—	250
Gutta Percha	Singapore	do.	110	125
Buffalo hides	do.	do.	80	5
Pineapples	do.	do.	13,750	4,500
Gambier	do.	U.S.A.	925	430
Cube Gambier	do.	do.	90	60
Black Pepper	do.	do.	225	45
Do.	Penang	do.	—	290
White Pepper	Singapore	do.	90	10
Do.	Penang	do.	—	65
Tapioca Pearl	Singapore	do.	180	200
Nutmegs	Singapore & Penang	do.	8	7
Sago Flour	Singapore	do.	150	200
Pineapples	do.	do.	1,500	7,000
Do.	do.	Continent	4,250	3,750
Gambier	do.	S. Continent	60	150
Do.	do.	N. Continent	190	150
Cube Gambier	do.	Continent	25	15
Black Pepper	do.	S. Continent	310	70
Do.	do.	N. Continent	375	15
Do.	Penang	S. Continent	25	20
Do.	do.	N. Continent	—	—
White Pepper	Singapore	S. Continent	20	—
Do.	do.	N. Continent	75	60
Do.	Penang	S. Continent	10	15
Do.	do.	N. Continent	5	20
Copra	Singapore & Penang	Marseilles	460	900
Do.	do.	Odessa	1,950	440
Do.	do.	Other S. Continent	150	150
Do.	do.	N. Continent	3,100	2,350
Sago Flour	Singapore	Continent	850	1,050
Tapioca Flake	do.	do.	5	110
Do. Pearl	do.	do.	35	—
Do. Flake	do.	U S.A.	—	—
Do. do.	Penang	U.K.	25	50
Do. Pearl & Bullet	do.	do.	150	70
Do. Flake	do.	U.S.A.	—	—

	Steamer.		Tons.	Tons.
Do. Pearl	do.	do.	10	250
Do. Flake	do.	Continent	30	—
Do. Pearl	do.	do.	110	90
Copra	Singapore & Penang	England	240	100
Gutta Percha	Singapore	Continent	55	50
Cube Gambier	do.	do.	—	—
T. Flake & Pearl	do.	do.	—	—
Sago Flour	do.	do.	—	—
Gambier	do.	S. Continent	—	—
Copra	do.	Marseilles	—	—
Black Pepper	do.	S. Continent	—	—
White Pepper	do.	do.	—	—
Do.	do.	U.S.A.	—	—
Pineapples	do.	do.	—	—
Nutmegs	do.	do.	—	—
Black Pepper	do.	do.	—	—
Do.	Penang	do.	—	—
White Pepper	do.	do.	—	—
T. Flake & Pearl	do.	do.	—	—
Nutmegs	do.	do.	—	—
Tons Gambier			350	400
Do. Black Pepper			110	420

SELANGOR.

Abstract of Meteorological Readings in the various Districts of the State for the month of October, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
General Hospital, Kuala Lumpur ...	29.872	146.8	80.5	88.3	72.0	17.3	76.0	.813	73.0	78	CALM	6.68	1.33
Pudoh Gaol „ ...	...	...	...	...	...	...	...	...	...	...	...	8.02	1.64
District Hospital „ ...	...	...	...	...	...	...	...	...	...	...	...	10.15	1.98
„ Klang... ...	...	...	...	89.1	69.3	19.8	...	...	...	...	...	6.22	1.58
„ Kuala Langat ...	...	...	...	87.4	72.9	14.5	...	...	...	...	...	10.11	2.57
„ Kajang ...	...	...	...	85.1	75.4	9.7	...	...	...	...	...	10.88	2.73
„ Kuala Selangor ...	...	...	...	87.2	74.8	12.4	...	...	...	...	...	15.50	3.40
„ Kuala Kubu ...	...	...	...	89.7	70.7	19.0	...	...	...	...	...	15.84	2.55
„ Serendah ...	...	...	...	91.5	70.6	20.9	...	...	...	...	...	10.68	1.90
„ Rawang ...	...	...	...	89.4	71.2	18.2	...	...	...	...	...	12.50	3.03
„ Sabak Bernam ...	...	...	...	...	...	...	...	...	...	...	...	8.14	3.16

OFFICE OF SENIOR MEDICAL OFFICER,
Kuala Lumpur, 24th November, 1910.

Senior Medical Officer, Selangor.

NEGRI SEMBILAN.

Abstract of Meteorological Readings in Negri Sembilan Hospitals for the month of October, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Seremban Hospital		151.2	81.4	86.8	71.8	15.	76.	.800	72.5	74.6	WNW	14.82	3.36
Mantin												7.99	2.35
Tampin												8.72	2.70
Kuala Pilah												7.08	1.09
Jelebu												8.20	1.94
Port Dickson Town												8.73	1.56
Do. Beri-Beri												6.75	1.41

MEDICAL OFFICER IN CHARGE'S office,
Seremban, 11th November 1910.

A. J. M. MOSLEY,
S. M. O.

KELANTAN.

Abstract of Meteorological Readings in Kelantan for the Month of September, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
			° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	° *F.*	%		Ins.	Ins.
Kota Bharu	..	150.5	82.08	86.98	74.30	12.68	78.52	1.254	76.52	82.	...	7.50	1.28
* Kuala Lebir	...	...	78.5	88.0	72.4	15.6	75.3	.815	73.1	83.5	...	6.63	2.03
Kuala Pahi	...	...	85.06	72.16	12.90	...	...	...	...	...	...	7.98	1.81
Taku Plantation	...	...	...	...	...	...	...	...	...	...	...	7.16	1.19
Pasir Besar	...	...	...	...	...	...	...	...	...	...	...	9.48	1.63
Nenggiri	...	...	...	...	...	...	...	...	...	...	...	5.58	1.60
Pasir Tinggi	...	...	...	...	...	...	...	...	...	...	...	7.44	2.09
Chaning Estate	...	...	...	...	...	...	...	...	...	...	...	6.87	1.16

* Supplied by the courtesy of the Kelantan Planters' Association.

Residency Surgeon's Office,
Kota Bharu, *20th October, 1910.*

John D. Gimlette,
Residency Surgeon, Kelantan.

KELANTAN.

Abstract of Meteorological Readings in Kelantan for the month of October, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° F.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	%		Ins.	Ins.
Kota Bharu ...	...	150.8	81.53	86.00	74.00	12.00	78.26	.897	76.0	84.8	...	15.65	2.42
Kuala Lebir ...	...	...	77.4	87.9	72.1	15.1	74.8	.854	74.5	86.3	...	11.1	1.7
Kuala Pehi ...	...	...	...	84.67	72.13	12.54	...	...	...	...	...	10.57	3.38
Pasir Gajah Estate ...	...	...	...	86.0	74.0	12.0	...	...	...	...	...	8.51	1·50
Taku Plantation ...	...	...	...	...	...	...	...	...	...	...	...	13.2	1.8
Pasir Besar ...	...	...	...	...	...	...	...	...	...	...	...	16.7	2.5
Nenggiri ...	...	...	...	...	...	...	...	...	...	...	...	22.6	3.8
Channing Estate ...	...	...	...	...	...	...	...	...	...	...	...	10.50	3.17
Pasir Tinggi ...	...	...	...	...	...	...	...	..	...	...	...	9.23	1.92

* Supplied by the courtesy of the Kelantan Planters' Association.

John D. Gimlette,
Residency Surgeon,
Kelantan.

Residency Surgeon's Office.
Kota Bharu, *22th November, 1910.*

PENANG.

Abstract of Meteorological Readings in the Prison Observatory, Penang, for the month of October, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Mean Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Mean Maximum.	Mean Minimum.	Mean Range.	Mean Wet Bulb.	Mean Vapour Tension.	Mean Dew Point.	Mean Humidity.			
	Ins.	°	°	°	°	°	°	°	°	%		Ins.	Ins.
Prison Observatory Penang ...	29·912	148.0	82·0	89·2	71·8	17·4	76·2	·773	72.4	70.6	S.E.	17·28	1.77

Prison Hospital.
Penang, 26th November, 1910.

E. Arthur Gimlette,
Medical Officer.

PERAK.

Abstract of Meteorological Readings in Perak for the month of October, 1910.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Taiping	...	110	81.91	92	70	25	77 02	864	...	81	...	16.52	3.13
Kuala Kangsar	...	...	79 59	92	67	25	75.46	827	...	82	...	14.54	2.22
Batu Gajah	...	108	79 51	91	72	19	76.08	852	...	85	...	10 31	1.52
Gopeng	...	...	79.76	91	69	22	74.97	804	...	80	...	18.12	1.88
Ipoh	...	...	80 20	91	71	20	75.62	828	...	80	...	12.29	2.00
Kampar	...	...	80.13	93	68	25	75.92	841	...	82	...	14.10	2.60
Teluk Anson	...	...	80.67	91	69	22	76.80	872	...	85	...	9.12	1.50
Tapah	...	...	80.04	91	69	22	75.88	837	...	82	...	13.46	2 40
Parit Buntar	...	...	80.50	89	71	18	76 42	856	...	82	...	14.00	3 96
Bagan Serai	...	...	80.88	90	72	18	77.04	879	...	85	...	13.03	3.12
Selama	...	...	79.91	91	71	20	75.72	885	...	82	...	25.35	6.20

OFFICE OF SENIOR MEDICAL OFFICER.

Ipoh, 17th. November 1910.

S. LUCY,

Senior Medical Officer, Perak.

SEREMBAN.

Table showing the Daily Results of the Reading of Meteorological Observation taken at the General Hospital, Seremban, for the month of October, 1910.

Date.	Temperature of Radiation.						Temp. of Radiation.		Wind Direction.		Temp. of Evaporation.			Computed Vapour Tension			Relative Humidity.			Clouds 0 to 10			Cloud and Weather Initials.			Rain.
	9 H.	15 H.	Mean.	Maximum.	Minimum.	Range.	Sun.	Difference Sun & Shade.	9 H.	15 H.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H.	Mean.	9 H.	15 H.	21 H	9 H.	15 H.	21 H	Inches.
1	82	86	84.	88	72	16	153	65	N	S W	72.	72.8	72.4	.785	.808	.796	72	64	68	0	0	0	S	S	S	
2	80	87	83.5	88	71	17	148	60	W	S W	71.6	73.0	72.7	.775	.837	.806	75	65	70	0	0	0	S	S	S	
3	76	83	79.5	85	72	13	155	70	S W	S W	72.6	73.	72.8	.801	.810	.805	89	72	80.5	0	5	0	S	C	S	
4	82	87	84.5	88	70	18	155	67	W	S W	70.3	72.2	71.2	.742	.792	.767	68	61	64.5	0	0	0	S	S	S	
5	80	86	83.	87	73	14	145	52	W	S W	71.6	72.8	72.2	.775	.808	.791	75	64	69.5	0	0	0	S	S	S	
6	79	87	83.	89	73	16	157	68	W	S W	72.3	73.9	73.1	.793	.837	.815	80	65	72.5	0	0	6	S	S	C	
7	78	88	83.	90	72	18	152	62	W	S W	71.2	68.4	69.8	.760	.698	.729	70	52	61.5	0	0	0	S	S	S	
8	82	88	85.	90	72	18	156	66	W	S W	70.3	71.6	70 9	.742	.775	.758	68	58	63	0	0	0	S	S	S	
9	79	84	81.5	86	71	15	142	56	N W	N W	72.9	70.7	72.3	.859	.751	.705	85	64	74.5	0	0	0	S	S	S	
10	77	81	79.	83	72	11	149	66	W	N W	73.6	76.	74.8	.829	.897	.863	89	85	87	7	5	0	N	C	S	.15
11	81	77	79.	89	70	19	150	61	N	N W	70.9	73.6	72.2	.757	.829	.793	72	89	80.5	0	10	6	S	N	C	.22
12	79	78	78.5	87	71	16	150	63	N W	N W	72.3	74.6	73.4	.793	.857	.825	80	80	84.5	0	7	10	S	N	N	1.35
13	79	87	83.	88	71	17	154	66	N W	N W	72.3	67.3	69.8	.793	.669	.731	80	52	66	0	0	0	S	S	S	
14	82	84	83.	88	73	15	151	63	N	N W	70.3	70.7	70.5	.742	.751	.746	68	64	66	0	0	0	S	S	S	
15	77	84	80.5	85	72	13	145	60	N W	N W	70.2	70.7	70.4	.730	.751	.745	70	64	71.5	0	0	0	S	S	S	
16	82	85	83.5	86	72	14	148	62	N W	N W	72.	71.8	71.9	.785	.781	.783	72	64	68	0	0	0	S	S	S	1.74
17	77	85	81.	86	71	15	138	52	W	N W	73.6	73.4	73.5	.820	.826	.827	89	68	78.5	0	0	0	S	S	S	
18	76	84	80.	86	72	14	149	63	W	N W	74.3	74.	74.1	.848	.840	.844	94	72	83	10	5	0	S	C	S	3.06
19	80	77	78.5	85	74	11	144	59	N W	N W	73.3	71.9	72.6	.820	.783	.801	80	84	82	0	10	7	S	N	N	3.36
20	78	83	80.5	86	71	15	157	71	N W	N W	72.9	76.3	74.6	.810	.905	.857	84	80	82	6	0	4	G	C	C	.04
21	80	84	82.	85	72	13	153	68	N W	N W	73 3	74.	73.6	.820	.840	.830	80	72	76	5	0	0	C	S	N	.06
22	78	85	81.5	87	71	16	157	70	N W	N W	72.9	73.4	73.1	.810	.826	.818	84	68	76	0	0	8	C	S	N	.02
23	77	84	80.5	86	72	14	153	67	W	N W	71.9	70.7	71.3	.783	.751	.767	84	64	74	0	0	0	S	S	S	
24	77	82	79.5	85	72	13	155	70	N W	N W	70.2	73.6	71.9	.730	.830	.784	79	76	77.5	2	0	8	S	S	S	1.80
25	80	84	82.	86	72	14	158	72	N W	N W	69.0	75.7	72.8	.732	.888	.810	71	76	73.5	0	0	0	S	S	S	.30
26	78	83	80.5	88	73	15	152	64	N W	N W	71.2	73.	72.1	.766	.810	.787	79	72	75.5	7	0	0	N	S	S	.40
27	79	84	81.5	87	71	16	154	67	W	W	73.9	74.	73.9	.830	.840	.839	85	72	78.5	0	0	8	S	S	N	.15
28	77	87	82.	88	70	18	153	65	W	S W	71.9	72.2	72.	.783	.702	.787	84	61	72.5	0	0	0	S	S	S	
29	79	85	82.	86	73	13	154	68	W	N W	73.9	75.1	74.5	.830	.873	.856	85	72	78.5	0	0	0	S	S	S	.06
30	80	84	81.	87	73	14	150	63	N	N W	71.6	74.	72.8	.775	.840	.807	75	72	73.5	0	0	0	S	S	S	
31	81	78	79.5	86	72	14	153	67	W	N	74.3	74.6	74.4	.840	.857	.853	80	89	84.5	0	6	0	S	C	S	1.21
Mean.	79	83.8	81.4	86.8	71.8	15	151.2	64.2	W	N W	72.1	72.9	72.5	.790	.811	.800	79.4	70	74.6							14.82

Seremban,
11th November, 1910.

Highest Temperature 90
Lowest Temperature 70

Greatest Rainfall in 24 hours 3.36

A. J. M. CLOVELY,
Senior Medical Officer in Charge.

NUMBER OF TREES IN AN ACRE OF GROUND SET AT REGULAR DISTANCE APART IN SQUARE.

Distance Apart.	Number of Plants per Acre.
1 foot by 1 foot	43,560
2 feet by 2 feet	10,890
3 „ „ 3 „	4,840
4 „ „ 4 „	2,722
5 „ „ 5 „	1,742
6 „ „ 6 „	1,210
7 „ „ 7 „	888
8 „ „ 8 „	680
9 „ „ 9 „	537
10 „ „ 10 „	435
11 „ „ 11 „	360
12 „ „ 12 „	302
13 „ „ 13 „	257
14 „ „ 14 „	222
15 „ „ 15 „	193
16 „ „ 16 „	170
17 „ „ 17 „	150
18 „ „ 18 „	134
19 „ „ 19 „	120
20 „ „ 20 „	108
25 „ „ 25 „	69
30 „ „ 30 „	48